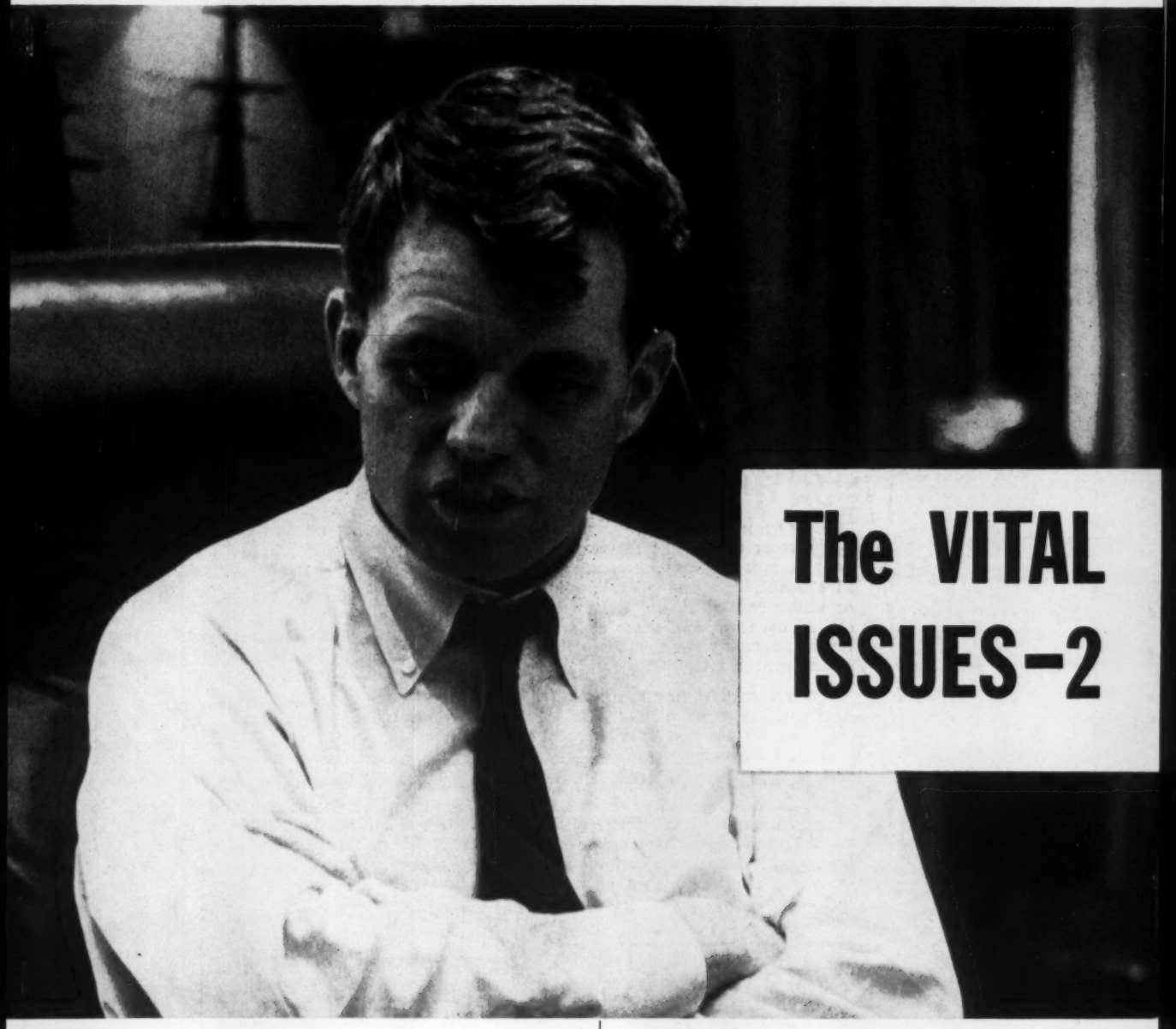
IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication APRIL 13, 1961



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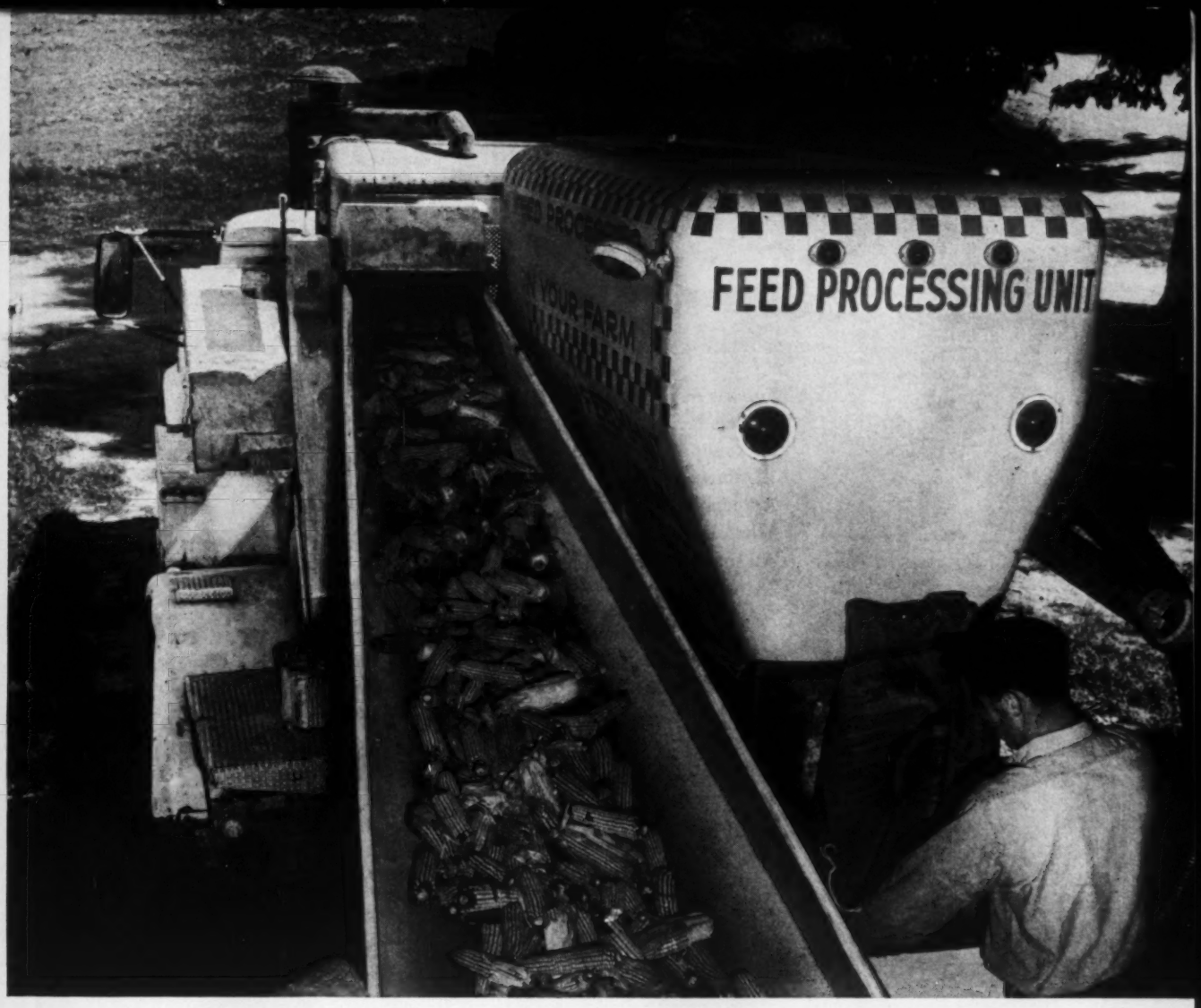

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Special This Week

Robert Kennedy's Stand on Mergers

Under Attorney General Robert Kennedy, the Dept. of Justice plans vigorous enforcement of antitrust laws. This includes the vital area of corporate mergers, discussed thoroughly in this interview. This is the second of The IRON AGE's series on The Vital Issues Facing Management. p. 68

Foreign Cars Cling to U.S. Market

To boost sagging U.S. sales, foreign automakers displayed their best at New York's International Auto Show last week. They are confident there is still a strong market for their cars. But they admit that the going is getting rougher. p. 59

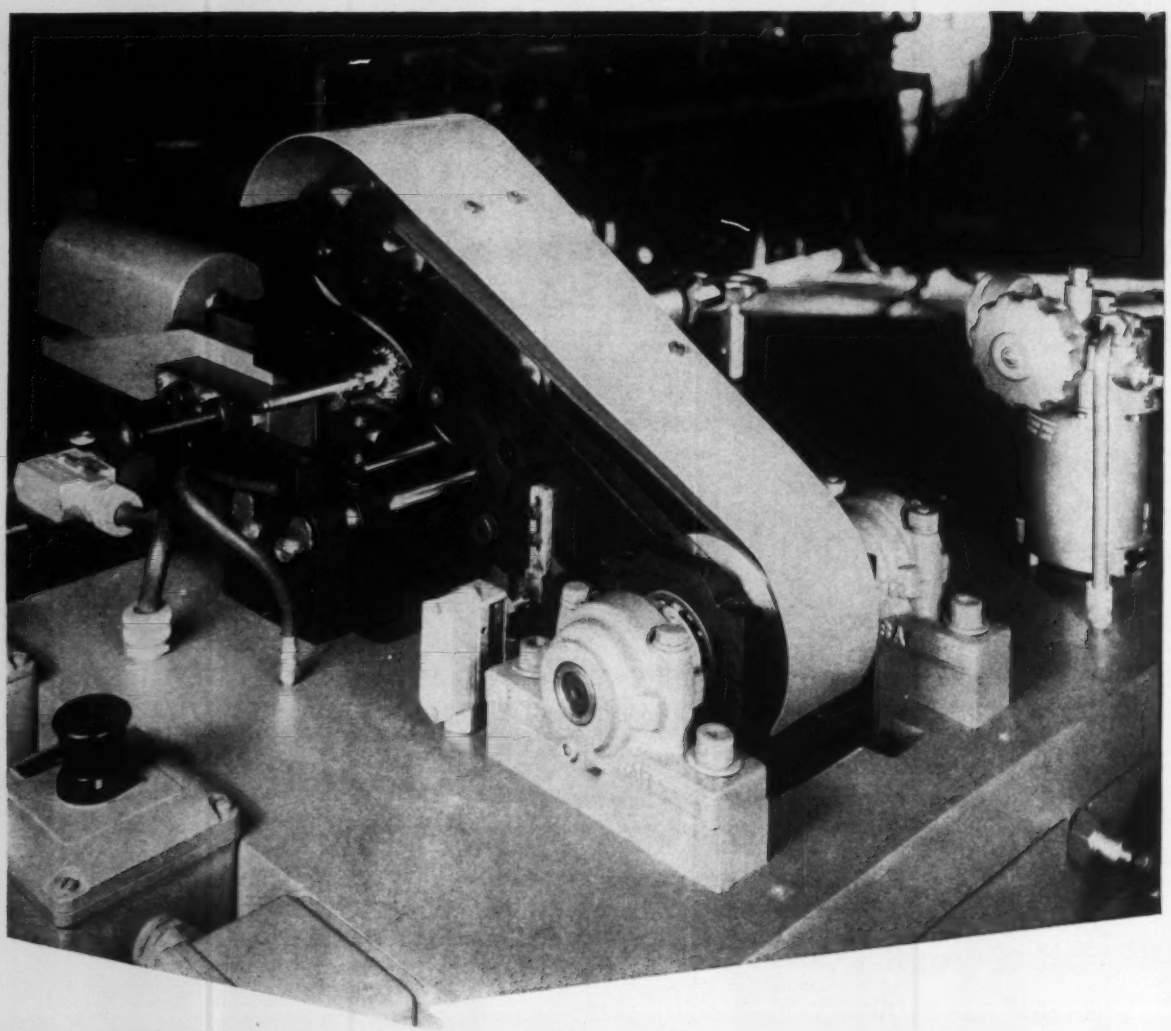
Big Steel Push Coming in Japan

In the next decade, Japan's steelmakers expect to double their present output levels. But the Japanese don't plan to sell very much raw steel. Instead, they hope to increase home consumption and export more manufactured products. p. 87

Next Week

How Much Momentum in the Upturn?

Most businessmen have noted at least a mild upturn in recent weeks. The questions now: How long will it last? How much momentum behind it? In next week's special report, metalworking executives speak up on the business outlook.



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Report From the Far East

The Laos Situation: Yes, It's Quite Unclear

Probably one of our difficulties in understanding the Laos fiasco is simply that we are Western-minded while they are Oriental-minded. That makes a big difference. It may help explain things a little, too.

Admittedly, we have to draw the line somewhere on the Red Chinese and the Soviets. But if you were to visit Laos, Thailand and South Vietnam, you might be puzzled. The problem is not very simple: Certainly not as simple as the news dispatches lead one to believe.

Probably 90 pct of the people in Laos think the world is flat. As a rule, they know nothing at all or very little about us—even that we exist. They have more pressing personal problems of their own.

Thais know little about us except probably only as tourists visiting their country—trying to sort out the red bank notes from the green and brown ones. The average Thai knows little and cares less about who we are and why we are interested in the Southeast Asia Treaty Organization.

In Laos the fight for power involves about 200 top people in that nation. Same for other areas. The people and the army rally to those they think have the power. It is as simple—or as complex—as that.

SEATO members are by no means of one accord on what ought to be done in Laos. Many think that the nation is being torn by a civil war. Thus, they feel SEATO cannot intervene. SEATO's recent resolution was vague because no one knew just what would or would not be done in Southeast Asia.

Statements by our diplomats were those usually made by diplomats. Being on the scene and having talked to SEATO people, I think Secretary of State Rusk got about all he could have hoped for—taking in all the angles.

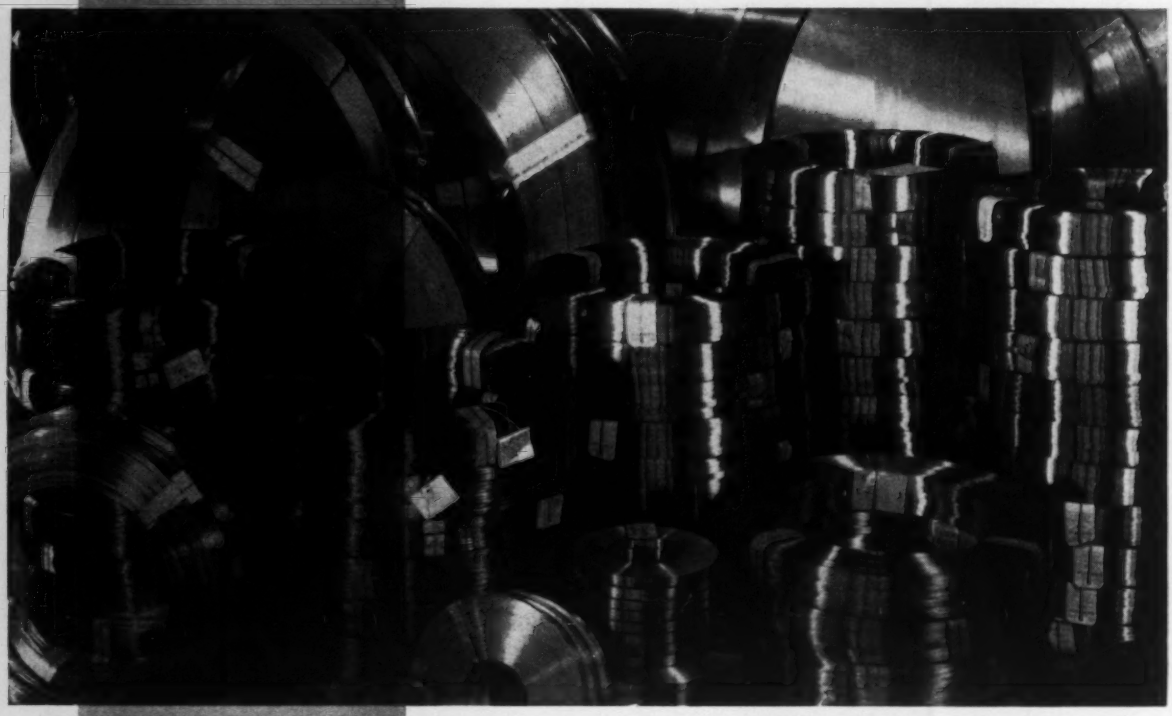
How we are going to resolve the Laos situation remains to be seen. If we are pulled into a war, it is a bad place to be involved. Yet if a strong stand is not taken, the Reds will feel they can move into any area they choose. But even that does not mean we have to go willy-nilly into an area where the people don't know us—and don't know what the fighting is about. The same goes for Thailand and South Vietnam.

When you realize that the people—including those in the army—are Buddhists, sworn to peace and to scorn fighting, you know we have a problem. You also realize why the SEATO statements do not always resemble those made by Western nations.

Tom Campbell

Editor-in-Chief

15 Proofs of SANDVIK SPRING STEEL QUALITY



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Solid Base Forms Under Uptrend

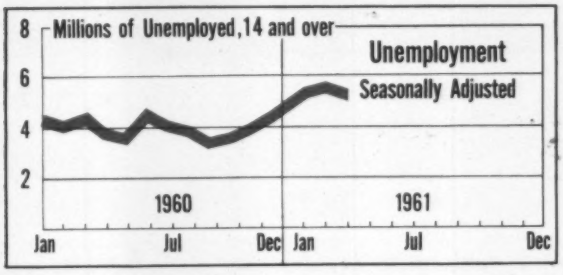
Businessmen are holding their breath. There's no doubt but that business activity has picked up measurably in the last 10 days. If it were not for the aches and pains suffered in a dozen false starts, they would be cheering on the upstart recovery with more zest.

The March figures, which are still coming out, do not show the real trend. Steel orders are up. Auto production schedules only late last week were re-evaluated and increased substantially over the second quarter rate. Some of the brisk pickup will ease (like the steel company a week ago that received orders equal to 75 pct of its capacity). But indications are strong that the upturn, if not great, has stabilized, and will continue into the summer.

Unemployment Dips, But How Much?

It's true that unemployment continues to be the big problem. Even though the number of jobless in March declined from about 5.7 million to 5.495 million in February, the decline was less than expected. As an indication, 25 more major industrial areas were added to the Dept. of Labor's list of substantial unemployment. The total of 101 areas in this category is higher than the total of 89 at the low point of the 1957-58 recession.

On the basis of the new pickup in business, the



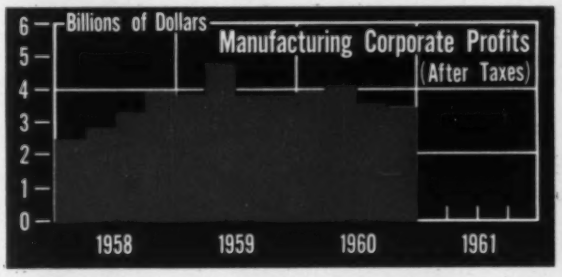
number of jobless should be cut more significantly in April. However, the rate of re-employment usually lags behind any recovery and a major cut is not likely this month.

Scrap Export Pattern May Shift

The scrap export market may take a turn. Exports to Japan have supported a recent upsurge in prices. But the pattern may change. Japanese steelmen are miffed over an increase in the "floor" in the export price and have made attempts to contact dealers directly. Recently, a split by the Japanese into two groups has created more competition in bidding and raised scrap prices. Reason for the split, however, was conviction of one group that lower prices could be obtained.

Lean, Hungry, but Efficient

Profits of manufacturing companies should show a pickup from the final quarter of 1960 when earnings reached $3.6 billion. Business in the first quarter of



1961 was only a bit better and not as good for many companies. But more are now operating in a lean, trimmed-down, but efficient manner. Most of the corporate fat was lost in the final months of 1960. And this includes wasteful manufacturing expenses as well as slimmer payrolls. Companies coming out of the recession, if the pickup continues, will find themselves in good shape, even if a little hungry.

PA's See More Forward Buying

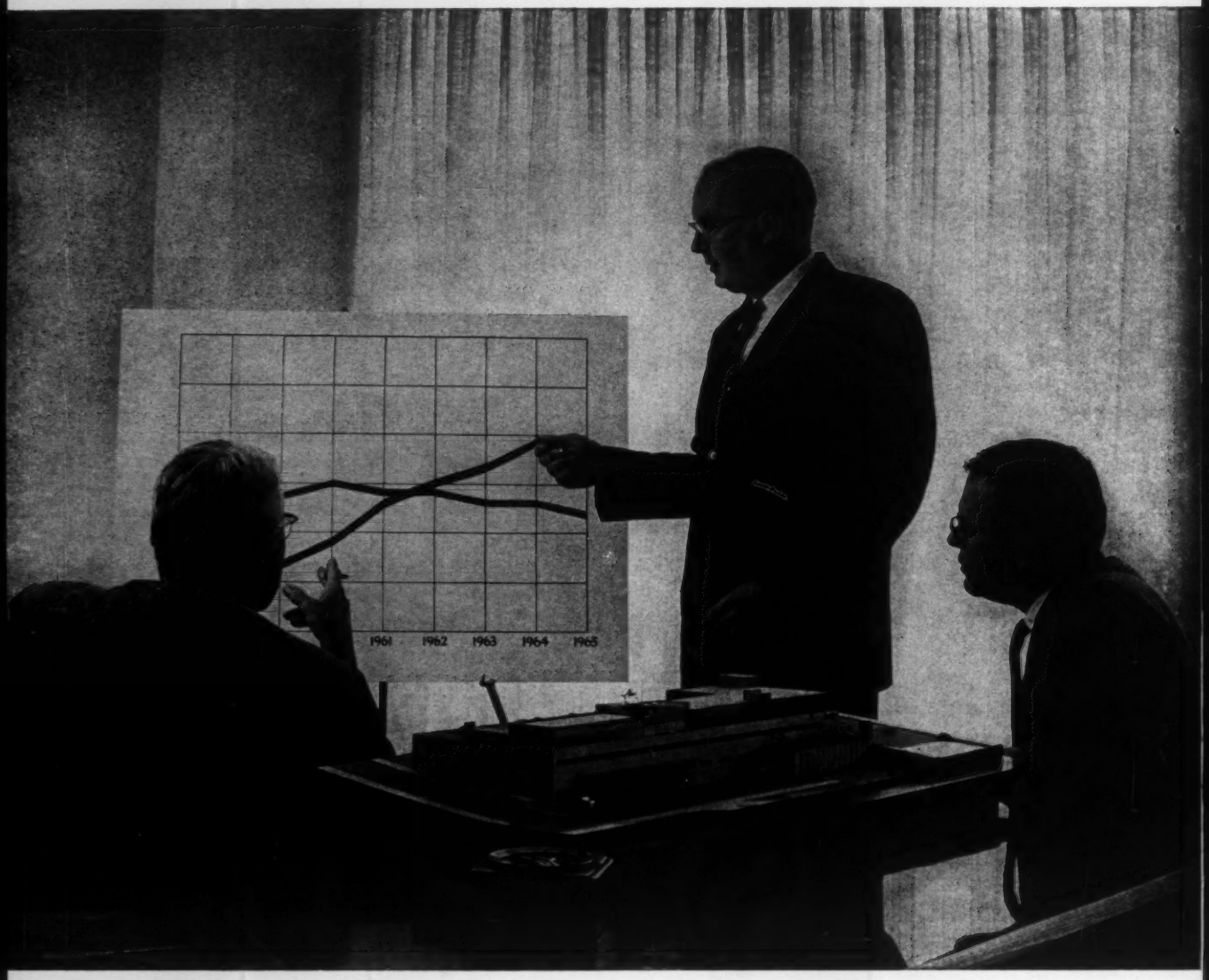
The March survey of the National Assn. of Purchasing Agents indicates, for the first time in months, general improvement in both new orders and production. Also indicated, more forward buying, less inventory cutting.

Revenue Freight Picks Up

Railroads expect to be handling more revenue carloads of freight in the second quarter than the first. But the estimate still lags 5.6 pct behind the second quarter of this year. The national forecast by the National Assn. of Shippers Advisory Boards indicates that 6.4 million carloadings (of the 32 principal commodities) can be expected in the second quarter. The figure for the first quarter: 5.8 million.

Principal changes from the same period of 1960 are in ore, down 26.9 pct; iron and steel, down 13.5 pct; autos and trucks, down 14.4 pct; vehicle parts, down 8.5 pct from the second quarter of 1960.

Pre-Engineering by **KAISER ENGINEERS** answers basic plant expansion questions...



Profitability? Faced with the decision to expand your plant facilities, you should first determine whether all elements combine to form a pattern of future profitability. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. The studies and evaluations furnished by KE Pre-Engineering represent only one phase of total KE services. Kaiser Engineers designs and builds for the Steel industry...offers skilled experience in all types of facilities from raw material plants to finishing mills. From Pre-Engineering through design and construction, Kaiser Engineers provides complete one-company service and ingenuity based on years of experience.

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NAM: Bosses Must Sell Automation to Workers

Communications hold the key to overcoming the "natural tendency" of people to resist changes, E. F. Boubert, vice president industrial relations, Rockwell Manufacturing Co., told the National Assn. of Manufacturers' industrial relations institute.

"If management explains the why's and wherefore's to employees — sincerely and effectively — the efficiency and productivity curve in plant and office is bound to swing upward," he said. He cited recent surveys to support his contention.

Often, he said, failure to get through to the workers is the fault of management because management people write and say what they like to hear and say.

"When employees have the facts, and understand the economic reasoning behind them, they are likely to accept a company program enthusiastically; on the other hand, poor communications may mean indifferent acceptance or downright opposition," he said.

AFL-CIO: Blueprint To Ease Unemployment

AFL-CIO experts are proposing several programs to Congress to meet problems posed by unemployment due to automation.

Union proposals to a House subcommittee on unemployment and the impact of automation include:

A partial retirement system for older workers. It would allow workers between 60 and 65 to receive retirement benefits after their unemployment insurance benefits have run out.

More aid to retrain workers for new jobs. It would continue jobless benefits while workers are being retrained.

Enlarge U. S. Employment Service activities. Make more detailed studies to pinpoint industries where automation is going to displace workers.

Encourage shorter workweeks for industries with shrinking job markets.

Foster union-management cooperation to find new work for displaced workers.

Rail Unions Seek Guaranteed Wage

Backing for a guaranteed annual wage is being sought from the Presidential Study Commission by five operating railroad brotherhoods.

The guaranteed 12-month wage would apply to workers who have worked eight or more months in a calendar year and who have worked during any five of the preceding 10 years.

Labor Experts Speak Out

Here are some pointed thoughts from noted labor relations educator-experts made at the seventh annual Industrial Relations Conference sponsored by the Univ. of Michigan and Wayne State Univ.

Strikes and Lockouts—Traditional collective bargaining methods face a growing lack of confidence and cannot deal adequately with automation. While the right to strike and lock out must be retained, they are not good devices to settle some differences and the costs of their use can be excessive in terms of the stakes involved.—Prof. George W. Taylor, Univ. of Pennsylvania.

Retraining Workers — Crash programs to retrain workers laid off because of automation or plant closings benefit relatively few employees. A continuing program to upgrade employee skills would be much more effective . . . Severance pay is a negative approach to employer-employee relations because it's often used to pay off debts or used without constructive purpose. — Prof. Robben W. Fleming, Univ. of Illinois.

Featherbedding — Make-work rules and featherbedding are on the decline in industry as a whole. But they are still a big problem in industries with declining or intermittent employment, as well as those paying high hourly wage rates. And they are often a natural response to the complete failure of industry or of society to face up to a broader social problem.—Prof. James J. Healy, Harvard Univ.

Democracy in Unions—Unions rarely recognize the right of any organized opposition to develop within their ranks. Only two unions, the Ladies Garment Workers and the Typographical, explicitly allow factional groups to operate within their organizations. Union constitutions contain many provisions dealing with obligations and disciplining of members, few about the members' rights.—Prof. Joel Seidman, Univ. of Chicago.

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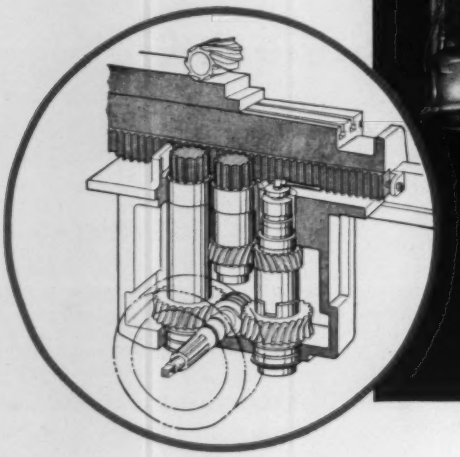

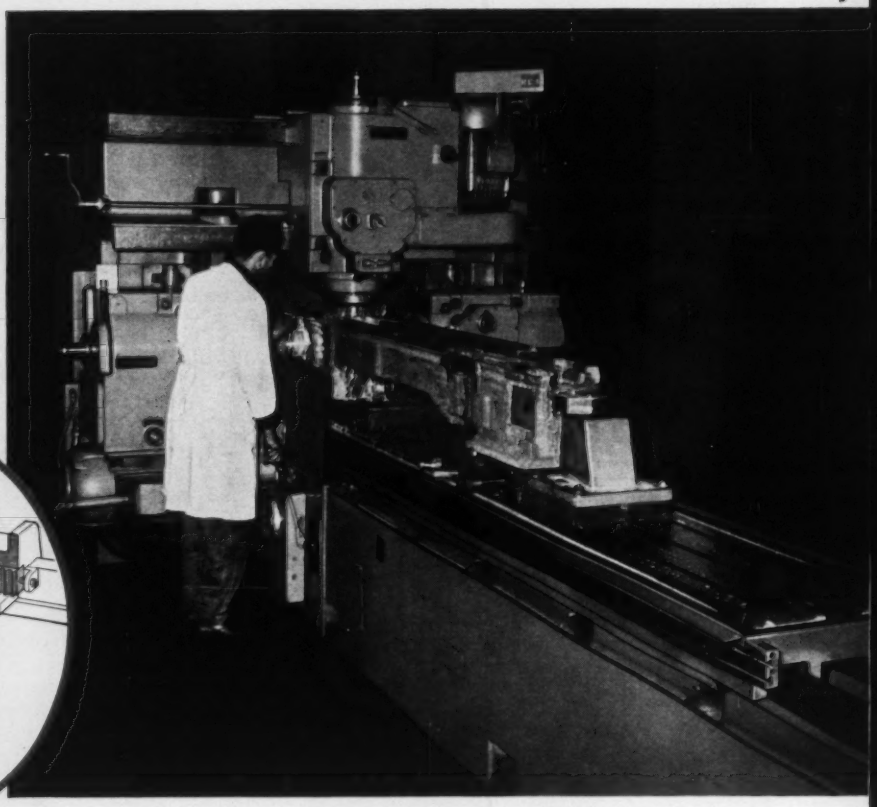

Three spindle heads, each taking a heavy cut on a lathe bed, are evidence of the smooth, powerful cutting capacity of CINCINNATI HyPowermatic Milling Machines. The one illustrated here is a No. 430-2614 Triplex, having 80 hp drive to the spindles. (Photo courtesy "Industrial World")

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★Depreciation Reform: When?

The government's promise of depreciation reform is being questioned by industry.

U. S. tax officials answer the questions with the familiar phrase "next year."

Although it's slow in coming, they say, depreciation liberalization will eventually get here. "Eventually," they say now, is 1962.

But in 1960, "eventually" was 1961. And liberalization of depreciation methods is still not off the ground. There are many reasons why it won't get off the ground soon, either.

(1) President Kennedy's plans for a special tax incentive to spur industrial investment in plant modernization has taken the rush label off overall depreciation reform.

(2) The Treasury Dept.'s survey of business depreciation practices, upon which recommendations will be based, will not be complete until this summer.

(3) When depreciation does come up it will probably be as part of a review of the entire U. S. tax structure and not as single legislation.

(4) To top it all off, when some sort of recommendations are finally made, depreciation reform still has to fight its way through the legislative maze of Congress.

Despite these delays, one Treasury Dept. source predicts liberalization of depreciation is a "sure thing" for 1962. "It's a sure thing for 1962," he says, "maybe."

■ Congress to Restore Lobbying Tax Breaks?

The new campaign to restore income tax deductions for legitimate lobbying expenses is making headway in Congress.

Rep. Hale Boggs, (D., La.) sponsor of the bill, is being joined by many influential congressmen in a fight against what they call "censorship by taxation."

The bill would reverse the Internal Revenue Service regulation barring tax deductions for contributions to any group which engages "extensively" in lobbying or "propaganda" activities. The Boggs Bill, which has an identical mate in the Senate, would permit tax deductions for such lobbying expenditures before any political body—Federal, state or local.

Business, labor unions, farm groups, and all spokesmen for organizations which conduct lobbying activities, are affected.

Outlook for passage of the bill is good.

■ Kennedy Faces Fight On Defense Spending

President Kennedy's defense spending program may run into Congressional trouble. But it won't be because he plans to spend too much. The problem is too little spending for projects Congress believes are needed.

Senators claim there is a conflict of interest between Congress and the Administration on spending for the B-70 super bomber and the Nike-Zeus anti-missile missile.

Sen. Richard B. Russel, (D. Ga.) chairman of the Senate Armed Services Committee, predicts that his committee and the Senate Appropriations Committee will increase spending on the two programs.

■ BAC Changed By Kennedy Facelifting

When the government's Business Advisory Council, a group of representatives of big corporations, meets next month it will be with a new face.

The new face was given the council by the Kennedy Administration. The council, told to yield to the Administration or be shut out of the government, agreed to place Sec. of Commerce Luther Hodges at its head. It also ends its off-the-record meetings with government officials.

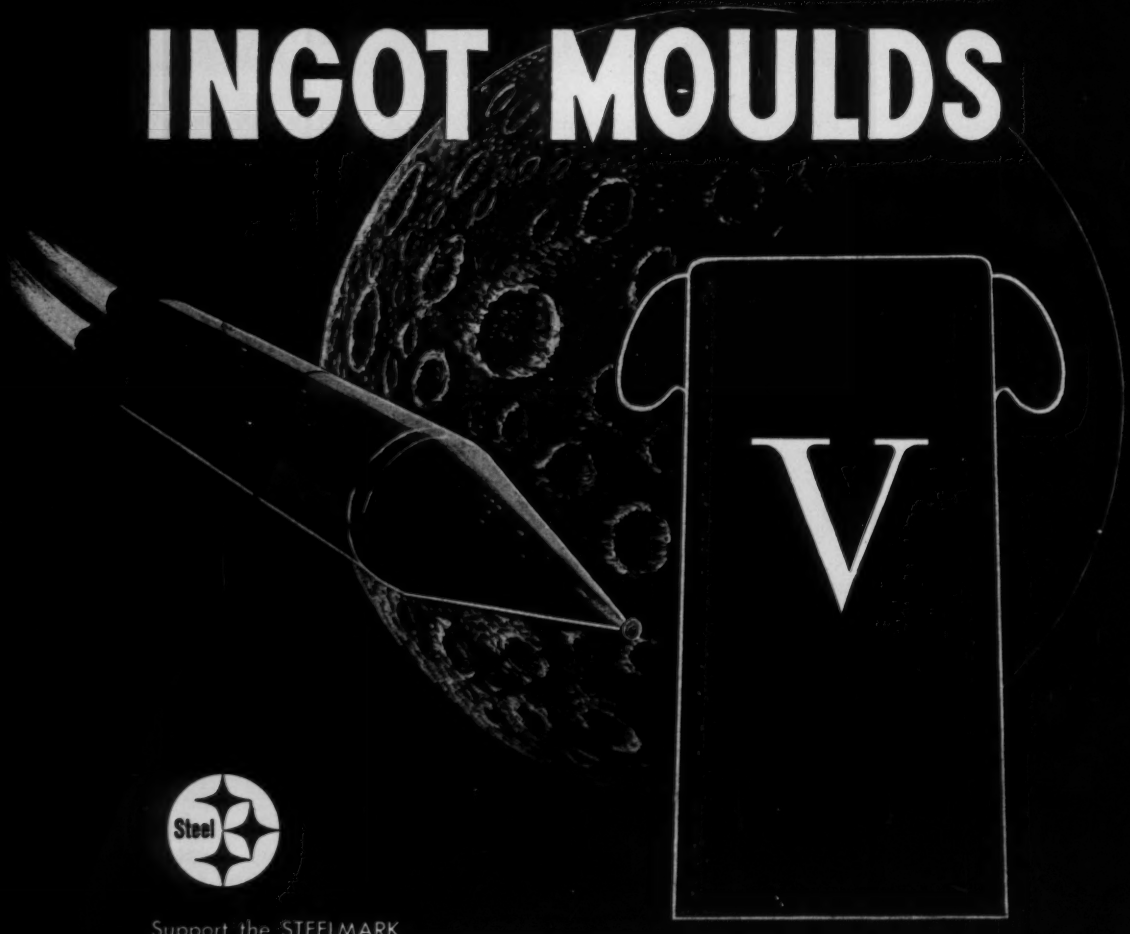
And, the group will have a new council chairman, Rodger M. Blough, board chairman of U. S. Steel Corp. However, Sec. Hodges, to be known as general chairman of the council, will have final authority over many of the group's functions.

BLOUGH: In New Job

Mr. Hodges' first reforms will be to allow press coverage of the heretofore secret reports to the council from high government officials and to bring small business representatives into the council.

For over 75 years steel has been poured into Valley Moulds, and now the new metals... used in space . . . . will also be poured into

VALLEY INGOT MOULDS



Steel

Support the STEELMARK

VALLEY MOULD AND IRON CORPORATION.

GENERAL OFFICES: Hubbard, Ohio
WESTERN OFFICE: Chicago, Illinois
NORTHERN OFFICE: Cleveland, Ohio

Seaway Opening: Another Postponement?

The St. Lawrence Seaway is scheduled to open Saturday. But it probably won't.

This will be the third annual opening of the Seaway. Ice has delayed opening day twice; chances are it will do it again. Reports from the Seaway Authority say there are places where ice is two or three feet thick. Officials anticipate the opening may be postponed to April 20. It could be April 25 before ships start arriving.

Operating facilities and vessel agents are ready for business, however. The Authority now waits safe placement of buoys and channel markers.

Ford Takes On International Look

Is Henry Ford II developing the giant Ford Motor Co. into a recognized "international" company?

Recent statements by the president and chairman of Ford indicate that may be the case. Of course, many companies have as large, or larger, world holdings and markets. But foreign holdings tend to remain foreign and domestic operations domestic.

Now, Mr. Ford is making the gesture of integrating world operations.

In statements last week, for example, he called for a program of world-wide sourcing of parts, tools, and raw materials by industry.

"In many instances," he said, "a low-cost imported part or component may make it economically feasible to produce or assemble in the U. S. a complete product that would otherwise be produced abroad, or not at all. Clearly such imported parts create jobs."

FORD II: World Goals.

He noted that Ford sees "increasing opportunity to expand the employment, production and profits of all our components by viewing all operations of Ford Motor Co. in world-wide perspective."

Ford, of course, has been under attack by unions and others for talk of importing parts for Ford-made cars in the U. S.

Capital Outlays In Canada Will Rise

Capital outlays in Canada are expected to rise this year, but only slightly.

The Bank of Montreal reports that a survey of 18,000 companies, government agencies and institutions shows capital spending of better than $8.3 billion. But this is only 1.7 pct higher than 1960's spending.

Says the bank: "Such relative stability does not represent a change of trend in aggregate capital outlays. But rather the continuation of a level that has prevailed for the past three years."

The big gains in capital spending this year will come from institutions and government departments. Manufacturing is expected to spend 5 pct less than in 1960. And utilities will probably show a 4.3 pct drop.

Strength at GATT

Congress is still urging "stronger efforts" by U. S. negotiators at GATT conferences to reduce foreign governments' tariff barriers against American exports.

The latest urging comes from the Senate Small Business Committee. The committee wants negotiators to pay particular attention to reducing barriers of the European Common Market.

U. S. Exports Rise Again in February

U.S. exports continue to rise. Latest figures from the Dept. of Commerce show a seven pct gain in February.

Foreign shipments for that month have been valued at $1.8 billion. January's seasonally-adjusted total was $1.6 billion. Exports in February, 1960 totaled $1.57 billion, according to Commerce.

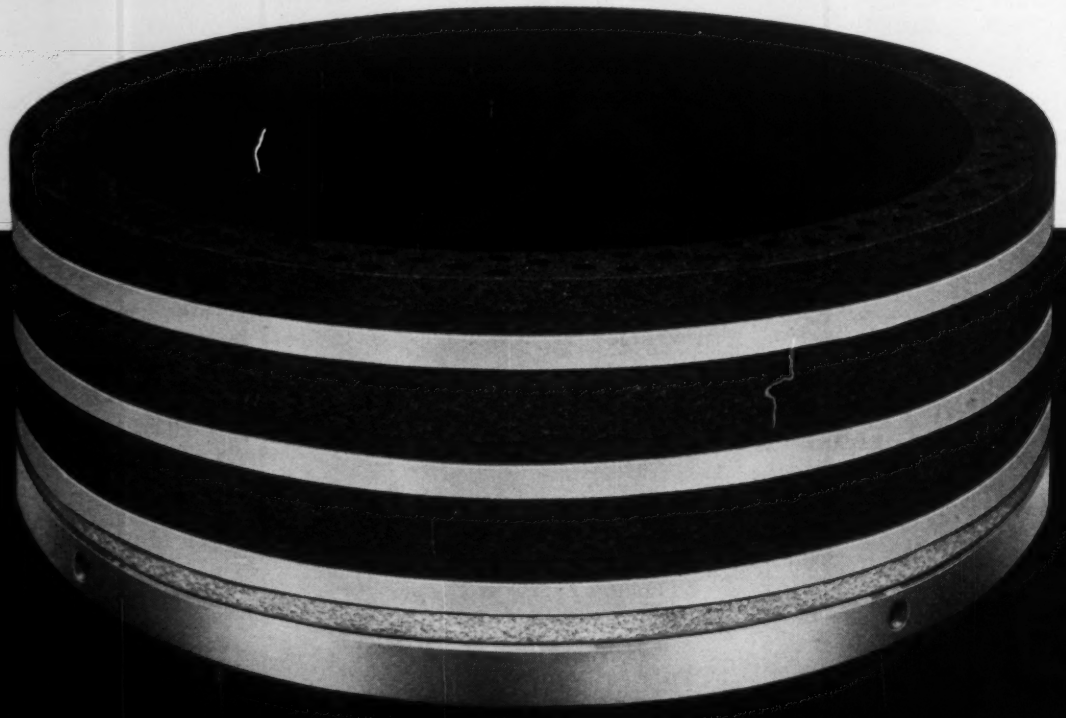
On a three-month cumulative basis, the export total from December through February was about

one pct higher than the preceeding three months.

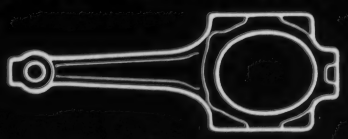
February's rise reflects gains in seven of the 11 major commodity groups. Among the products with the biggest gains were machinery and vehicles.

BK bond discs

ELIMINATE BURNING



Gardner cooler-cutting BK discs grind connecting rods without burning or work hardening—raise hourly output by 30%



production data

part	connecting rods
machine	Mattison vertical spindle grinder
rate	455 parts per hr.
(former rate	350 parts per hr.)
stock removal:	
rough	.010"-.015"
finish	.005"-.010"

GARDNER

abrasive discs

GARDNER MACHINE COMPANY, BELOIT, WISCONSIN

a subsidiary of Landis Tool Company

Molten-Metal Research

A fluorescent X-ray spectrograph pinpoints the surface chemistries of molten metals, while they're oxidizing. This instrument uses a resistance-wound electric furnace as a sample holder. The holder brings the molten surface to within 0.5 in. of the X-ray tube. This setup permits close-up studies of materials at heats up to 2550°F.

How to Lap Diamond Dies

Man-made diamonds serve in a lapping compound made by the Abrasives Div. of the Elgin Watch Co. Called Dymo-D, the new compound was developed specifically for lapping diamond dies. With this application, ultrafine man-made diamonds are now available in grinding wheels, micronized powders, and lapping and polishing compounds.

Reclaim Metallic Waste

It's now possible to separate valuable metals from spent solutions and to purify streams at the same time. Special foaming agents are dumped into a polluted stream. These agents extend their own surface activity to metallic ions. Foaming action carries all metal particles to the stream's surface, where they're skimmed off.

Steelmen Aid Farmers

Engineers at Utah State University are testing an all-steel water-control device that may revolutionize irrigation. Field tests of the galvanized units will continue through most of summer. These modular units promise farmer an easily-installed do-it-yourself irrigation tool. The newcomers are flexible enough to fit in small garden furrows or in large ditches.

Tooling Can Breed Waste

Look for a startling new captive- vs. outside-shop study on industrial costs. This study will soon be released by a Midwestern university. It claims that, contrary to common belief, mass producers lose money when they invade service areas. Data from case histories prove that captive operations ignore many fixed-overhead expenses. These operations are also subject to creeping inefficiencies. Moral? Whenever possible, it pays to leave tooling to outside experts.

Sheets From Liquid Steel

An experimental mill in the Soviet Union rolls steel sheets 0.8-1.2 mm thick directly from liquid steel. Liquid metal feeds through a funnel between water-cooled rolls. Without exerting any pressure on the metal, the rolls act as a mold. Early results show that the sheets can be sheared, bent, pressure formed and welded.

High-Speed Testing

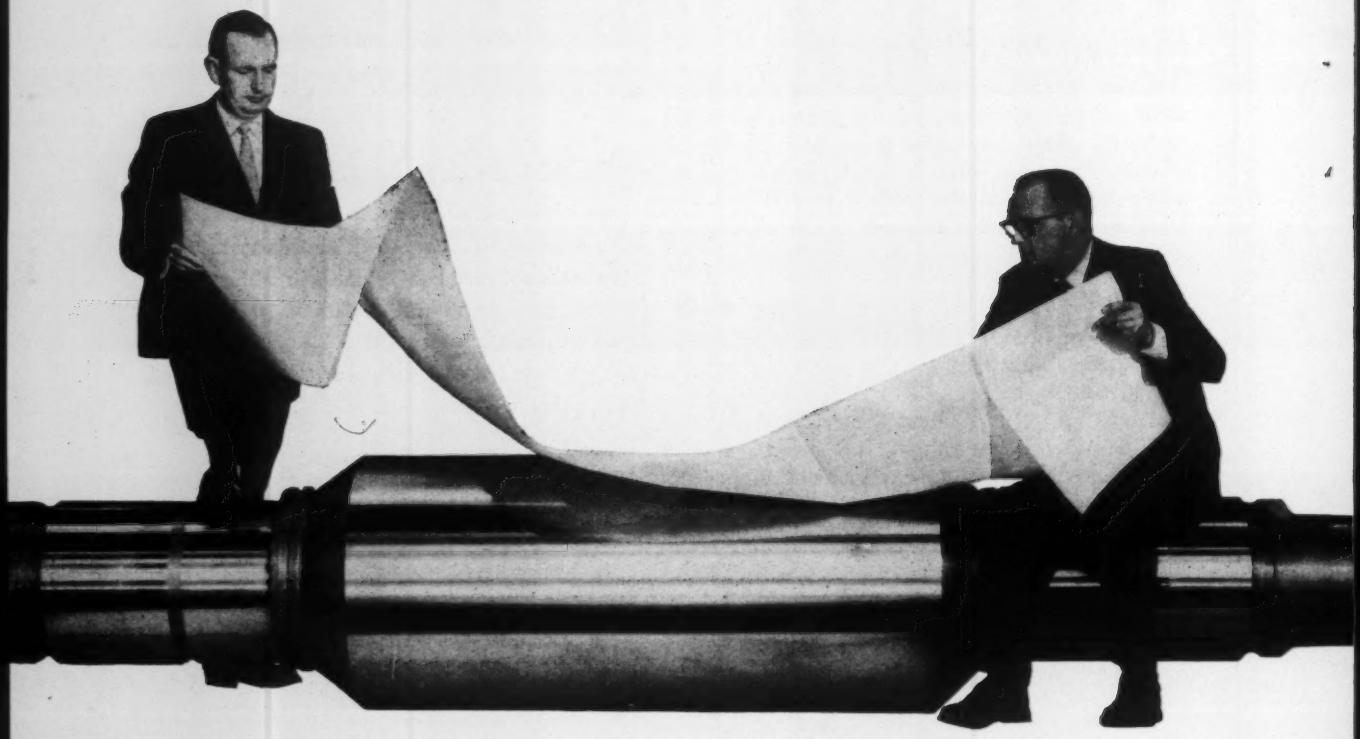
High-speed particle testing is now possible at velocities up to 22,000 fps. These tests take place in small-chambered lithium-charged gas guns. In comparing gas guns with electrical-acceleration systems for velocity and impact testing, an Air Force report notes that electrical systems have a higher potential. But the report points out that the guns should be used "until the limitations of gas accelerators are passed."

Ductile Beryllium

Studies for the Bureau of Naval Weapons prove that beryllium isn't inherently brittle. Impurities remaining in the metal after refinement are the culprits that cause brittleness. Scientists at The Franklin Institute have grown single crystals of beryllium with ductility that's 50 times better than the commercial product. Research is underway to exploit this breakthrough.

Rolling Welds Honeycomb

Without any costly tooling, hot-rolling mills pressure weld the peaks of corrugated-metal cores inside sandwich panels to honeycomb-cover sheets. Panel size is limited only by rolling-mill capacity. In addition to welding the cores to both covers, rolling also reduces a panel's thickness by 60 pct. After rolling, a retaining frame is sawed or sheared off and a metal-guard box is peeled away. The box protects the core and the face sheets during the joining process.



Analyzing history of roll use

means future orders are better produced Through constant following of roll performance, National Roll keeps an accurate log of its rolls in hundreds of applications. These records are carefully analyzed by National's metallurgical and production staffs—discussed with customers by sales representatives such as "Easy" Esary and Bill Williamson, pictured above. Knowing about roll performance, National can make sure a roll order meets specific operating requirements and can assure higher quality with maximum roll service. Analysis of roll performance is just one of the customer benefits available at National, and is one of the reasons we say . . . NATIONAL'S THE GROWING NAME IN ROLLS.

NATIONAL ROLL & FOUNDRY DIVISION
GENERAL STEEL CASTINGS CORPORATION, Avonmore, Pennsylvania
General Steel Castings Corporation, General Offices: Granite City, Ill. Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.
Subsidiary: St. Louis Car Company, St. Louis, Mo.

STEELMAKING AT JESSOP

Listen...

5...4...3...2...1...0...Lift Off!

The countdown is on.

Scientists and skilled technicians scan their instruments, alert to the least sign of malfunction.

Liquid oxygen has been piped into the fuel chamber of the gleaming Atlas ICBM poised on the launching pad. Other last-minute preparations are completed.

Tension mounts. It won't be long. Listen . . .

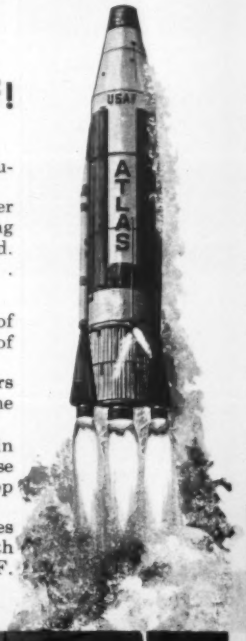
5...4...3...2...1...0...*Lift Off!*

The missile comes to life in a swirling cloud of vapor, exhaust and flame. The engine—capable of 360,000 pounds of thrust—roars thunderously.

Airborne now, the Atlas gathers speed and soars majestically on its predetermined course down the Atlantic range—a successful launching.

Jessop Steel Company makes several alloys used in the Atlas—steels forged and machined into precise but rugged mechanisms. And you will find Jessop steel in the launching pad "plumbing" too.

Swepco Tube Corporation of Clifton, N. J., makes piping for LOX systems that fuel the Atlas with liquid oxygen at temperatures of –300° F. to –320° F. *That's* punishment for any metal.



But Swepco's austenitic chromium nickel Rock-Forged pipe can take it. Ductility—to avoid fracture by reason of brittleness—is an all-important factor in this application.

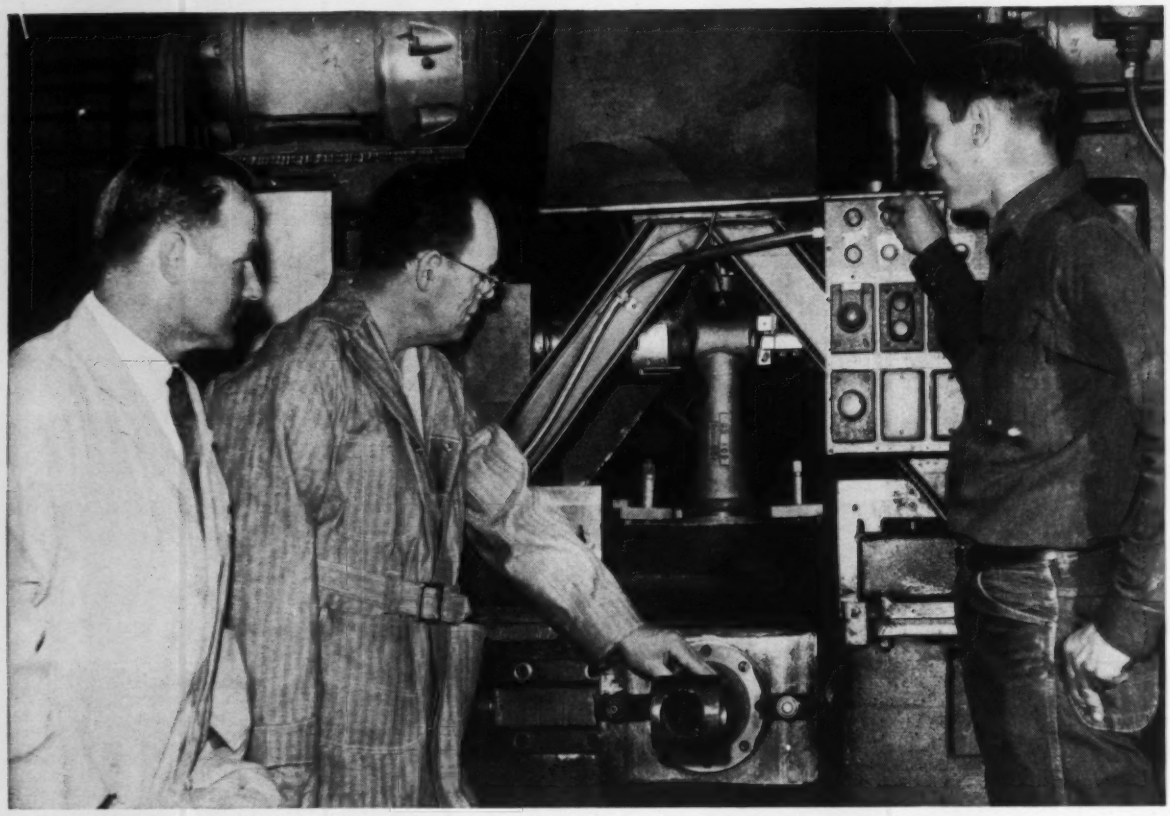
With a value of about 38 foot pounds by Charpy Impact Test, the piping supplied by Swepco handles the job with ease—with an added measure of safety against costly breakdown.

Swepco buys steel from Jessop for rock-forging. Why? Because through controlled chemistry and certain production techniques, Jessop and Swepco developed a steel second to none in workability in the cold forging process.

In making steel like this, experience counts . . . and Jessop has it. Call any of Jessop's 23 sales offices in North America and let us prove it to you.

Plants and Service Centers:
Washington, Pa. • Los Angeles • Chicago • Detroit • Owensboro, Ky. • Wallaceburg, Ont.

JESSOP



Kennametal Carbide Engineer—Tool Engineer—Machine Operator

3-man team solves operating problem

... by developing special tooling —reduced set-up time 84%—eliminated tool grinding

PROBLEM: Excessive machine down time and tool maintenance cost. On this operation, stub axles were bored on a special machine with four stations. Cutters with carbide-tipped serrated blades, used in rough boring heads, were set by trial and error—moved back and forth with each resharpening.

SOLUTION: Two special boring heads with Kendex* throwaway inserts were developed through cooperation of a 3-man team composed of the customer's tool engineer and machine operator and the Kennametal carbide engineer.

RESULT: Increased production, improved product, reduced machining cost. For example: for every 100 pieces produced, a day of machine down time for tool sharpening and resetting is saved. With Kendex heads, tool set-up time has been reduced from 3 hours to 30 minutes. Kendex inserts are indexed in 5 minutes (no resetting of tools required). Tool regrinding eliminated —previously required 5 hours after every 80 pieces machined.

That's the kind of IMAGINATIVE tooling service you can expect through your Kennametal carbide engineer. Thoroughly trained in carbide products, *he devotes his time exclusively* to the application of Kennametal* hard carbides . . . and is well qualified to provide on-the-spot tool analyses and recommendations. Frequently, he can suggest tools of special design that can be developed through our headquarters engineering and manufacturing facilities to perform several machining operations simultaneously.

Depth of on-the-job experience—plus the continuing development of a variety of tungsten, titanium, and tantalum carbide grades—has led to the use of Kennametal compositions for tooling and wear-spot applications in practically every industry. And our product development group, by working in close cooperation with customers, keeps coming up with new types of tooling and new abrasion-resistant applications—engineered to meet specific requirements.

We believe you will be interested in our booklet, "There's Profit in Retiring a Tradition," which gives facts on how some companies have reduced machining costs as much as 70 percent. Based on actual cases, it makes practical and profitable reading. Ask your Kennametal Carbide Engineer for a copy . . . or write direct to KENNAMETAL INC., Dept. IA, Latrobe, Pa.

*Trademark

33590

INDUSTRY AND KENNAMETAL ...Partners in Progress

Journalistic Integrity

Sir—The general treatment of business reports and the high caliber of the editorials in The IRON AGE are particularly noteworthy. Your analyses are a stimulating contact with fast changing concepts in an industry and a nation. Even though catering to a clientele of singular profile, your standards of objectivity point up a level of journalistic integrity seldom met. It gives me great personal satisfaction to have your publication as an object in discussing the ideal relation between facts and value judgment.—Howard D. Cole, Intercontinental Manufacturing Co., Inc., Garland, Tex.

On Line Managers

▪ Hundreds of letters from all parts of the country continue to arrive requesting reprints of the article "Line Managers Are the Key Men in Developing New Executives," by Moorhead Wright, in the March 2 issue of The IRON AGE. Some of the comments from these letters follow.—Ed.

Sir—"I have read your wonderful article and would like some of my other people to read it."—**Samuel Hamelsky, president, Morrison Steel Co., New Brunswick, N. J.;** "The article has aroused considerable interest among people here."—**H. L. Herranen, Rocketdyne Div., North American Aviation, Inc., Neosho, Mo.;** "This is an interesting article."—**Barney Dagan, Kaiser Steel Corp., Fontana, Calif.;** "I read this article with considerable interest."—**J. A. Barris, Anaconda Wire & Cable Co., Sycamore, Ill.;** "This article is extremely informative and a constructive aid to the problem of executive development. You are to be congratulated for recognizing the need for this type of article and Mr. Wright for a job well done."—**W. S. Anderson, Jr., Jones & Laughlin Steel Corp., Aliquippa, Pa.;** "I found this article to be very interesting, and desire to make a more complete distribution within my company."—**Carl Claus, vice president, The Babcock & Wilcox Co., New York, N. Y.;** "I enjoyed this article and could conveniently and effectively use some more copies."—**D. C. Broughton, A. O. Smith Corp., Milwaukee.**

Japanese Comments

Sir—I have just read Tom Campbell's article in the March 23rd issue of The IRON AGE entitled "How to Do Business in Japan." This is excellent and I would appreciate about 12 copies if they are available to pass on to other members of our organization.—John L. Young, vice president-engineering technology, United States Steel Corp., Pittsburgh, Pa.

Sir—We are very interested in the article you carried concerning business in Japan. We found your report concise and very clear. In that we do business in Japan, your suggestions are most welcome.—Norman Mundy, Connell Bros. Co., Ltd., Importers & Exporters, New York 17, N. Y.

Sir—Have just read with great interest your first article of a series of on-the-scene reports on Japan. Doing business ourselves with Japan, we appreciate very much your comments and how true they are.—W. J. Parsons, senior vice president, Pacific Scientific Co., Los Angeles, Calif.

Sir—I go to Japan often and am well acquainted with Tadayoshi Yamada, the man in the picture with the article. The article is well stated by Tom Campbell. He deserves lots of credit.—Raymond C. Schnuth, project engineer, Loftus Engineering Corp., Pittsburgh.

▪ Requested reprints are on the way to these and other writers.—Ed.

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STANDARDIZE 100%
ON SOUTHERN
FASTENERS
A stock of 1,500,000,000 USA-made fasteners means that Southern's variety of items, sizes, materials, head styles and finishes can be your source of constant supply. Standardize 100% on Southern fasteners and forget about carrying a large, costly, space-consuming inventory. Let Southern's variety and famous service help solve your fastener problems.
It will pay you to try Southern on your next order. Write today, using your letterhead, for our Stock List showing current variety of fasteners ready for delivery in large or small quantities. Address: Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.
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New York • Chicago • Dallas • Los Angeles
Machine Screws & Nuts • Tapping Screws • Stove Bolts • Drive Screws Carriage Bolts • Continuous Threaded Studs • Wood Screws
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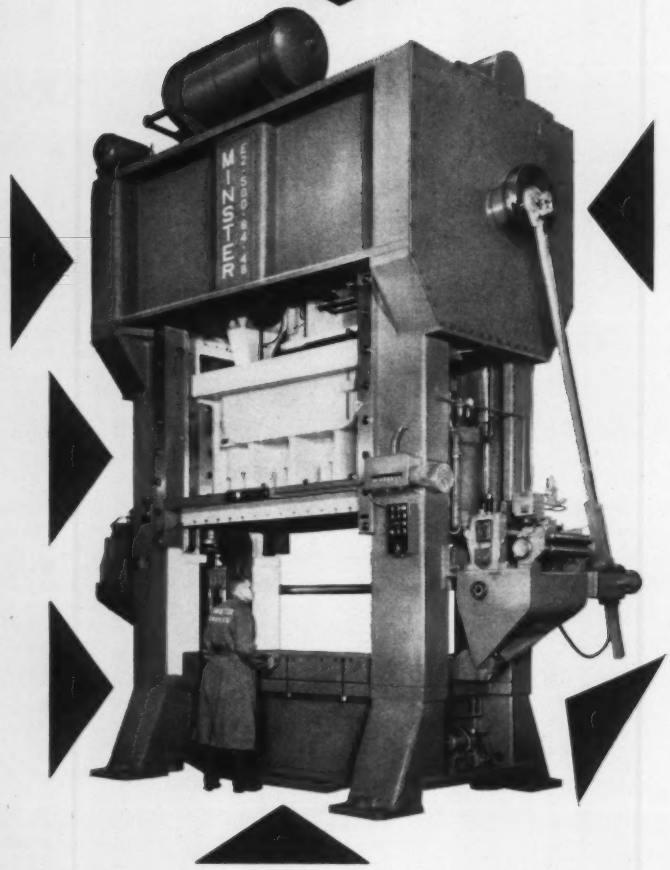
SCREW COMPANY

HIDDEN STRENGTHS and VALUES



There are many points of superiority in a Minster E-2 Heavy Duty Blanking and Progressive Die press . . . most of which are not immediately obvious at a glance. You might call them "hidden strengths and values." For example, the speed possibilities, the full eccentric shaft . . . the unique frame design.

If you buy with an eye to better all around performance, take a close look at the Minster E-2. 200 to 800 tons.
The Minster Machine Company, Minster, Ohio

MINSTER®

The Vital Issues

The tumult and shouting following the appointment of Robert Kennedy as Attorney General has died away, to a great extent. Now, most businessmen are awaiting first indications of what to expect from the Dept. of Justice as Mr. Kennedy gets down to work.

Probably the area of most interest to business is what Mr. Kennedy intends to do about enforcement of antitrust laws. And within this broad area, the field of highest interest is probably in mergers, acquisitions, and business liquidations.

Exclusive Interview—As the second in The IRON AGE's new series on The Vital Issues Facing Management, the Attorney General discloses his philosophy in this important area of antitrust enforcement.

The four-page exclusive interview starts on P. 68.

Managing Editor E. C. Beaudet, left, below (supported by R. W. Crosby, our Washington editor), conducted the interview in Attorney General Kennedy's office.

What impressed the managing editor most about Mr. Kennedy?

"His forthrightness and willingness to say what he believes."

Having seen the interview in type, we agree. In his interview, Mr. Kennedy holds back little, leaves no doubt as to where he stands, or how he will enforce antitrust measures.

You may recall the first of the Vital Issues series. In the March 16 issue, we interviewed labor expert George Taylor on the question of public participation in labor negotiations. In this series, we will continue to explore these vital issues, with exclusive interviews with men who are not only deeply involved, but who are in a position to do something about them.

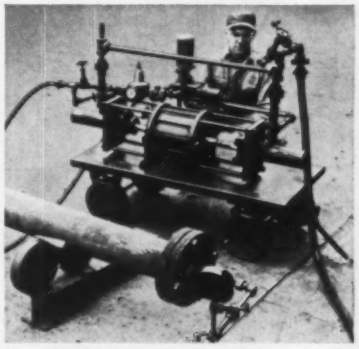
Error of Omission

It's a policy around here to identify the source of our cover photographs. Last week we failed to give credit to Pratt & Whitney Aircraft.

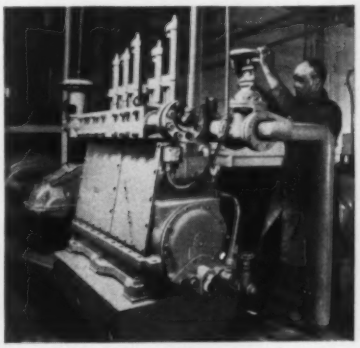
The photograph in question showed a man welding a titanium inlet guide for one of Pratt & Whitney's TF-33 turbo-fan engines.

MEETING IN WASHINGTON: For second article in series on the Vital Issues Facing Management, Attorney General Robert F. Kennedy is interviewed in Washington by Managing Editor E. C. Beaudet (left) and Ralph Crosby, IRON AGE Washington editor. (The interview begins on p. 68.)

Need a pump as tough as these?



A familiar sight at one plant is this Aldrich Hydraulic Pump. It's been given plenty of work to do pressure testing process equipment . . . pipe, heat exchangers, tanks, coils, special pressure vessels from 300 to 7330 psi. To get it from one of a dozen tasks to another, quickly, maintenance men have mounted the pump on a portable rig. The company reports that with this Aldrich Pump, equipment testing is faster, more efficient than before.



Two Aldrich reciprocating pumps lead a busy life here, keeping hydraulic presses on-line three shifts a day. For this molding and extrusion operation, pressures must be—and are—maintained at a steady, high level. The penalty for any deviation is up-and-down quality, soaring reject rate. This is rugged duty, but no unscheduled downtime has ever occurred since the pump was installed.

For pumps of 5 to 2500 hp, pressures to 50,000 psi, write Aldrich Pump Co., 8 Pine St., Allentown, Pa. You'll get a pump as tough as these because...

THE TOUGH PUMPING PROBLEMS GO TO

ALDRICH

POP'S school of filing

PICTURE ALL 6000 FILES ON THE WALLS OF THE SHOP-- MY, WHAT A SIGHT THAT WOULD BE!
POP WOULD PROBABLY HAVE THE CEILING COVERED WITH FILES, TOO!
THAT'S ONE USE THE NICHOLSON PEOPLE NEVER THOUGHT OF!
STAN RANDALL

Nicholson and Black Diamond files weren't designed for wall or ceiling covering . . . but to the busy shop man, a complete set of files for his particular requirements is always a pleasant sight . . . and quite often less than a half dozen versatile file types will do.

The Nicholson or Black Diamond Mill Bastard file is a good example of versatility. It's single cut for draw filing, tool sharpening, smooth finishing of metals and dozens of other uses . . . and it looks good on a wall even without the other 6000 Nicholson or Black Diamond files.

Try these files today*. Remember there's a Nicholson or Black Diamond file for every industrial requirement.

File Filosophy free on request. Write to Department A. A.

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COMING EXHIBITS

National Packaging Show — April 10-13, Lakefront Exposition Hall, Chicago. (American Management Assn., 1515 Broadway, Times Square, New York 36.)

Welding Show—April 17-21, New York Coliseum, New York. (The American Welding Society, 33 West 39th St., New York 18.)

Business Equipment Exposition—April 17-21, New York Coliseum, N. Y. (Office Equipment Mfg. Institute, 777 14th St., N. W., Washington, D. C.)

Powder Metallurgy Show — April 24-26, Hotel Sheraton - Cleveland, Cleveland. (Metal Powder Industries Federation, 60 E. 42nd St., New York 17.)

Castings Show—May 8-12, Brooks Hall, San Francisco, Calif. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Design Engineering Show — May 22-25, Cobo Hall, Detroit. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

MEETINGS

APRIL

National Assn. of Architectural Metal Manufacturers—23rd annual convention, Apr. 9-14, Plaza Hotel, New York, N. Y. Assn. headquarters, 228 North LaSalle St., Chicago 1, Ill.

Steel Shipping Container Institute, Inc.—Annual meeting, Apr. 11-13, Kenilworth Hotel, Miami Beach, Fla. Institute headquarters, 600 Fifth Ave., New York.

American Society of Lubrication Engineers — Annual meeting and exhibit, Apr. 11-13, Bellevue-Stratford, Philadelphia. Society headquarters, 5 N. Wabash Ave., Chicago.

Copper & Brass Warehouse Assn., Inc.—Annual meeting, Apr. 11-14, Colorado Springs, Colo. Association

(Continued on P. 24)

With these NEW features:

1. CECO BLOWMATIC PROGRAM CONTROLLER: for semi-automatic forging
2. NEW RAM INCHING DEVICE: makes die-setting easier and safer
3. FASTER ACTING ROD CLAMP: by means of double-acting clamp cylinder
4. NYLON-TIPPED KNOCK-OFF DOG: reduces shock, reduces wear

NOW – more than ever...

The CECO-DROP makes other gravity drop hammers obsolete

Write for new Ceco-Drop bulletin No. 105-L-1

CHAMBERSBURG ENGINEERING COMPANY • CHAMBERSBURG, PA.

CHAMBERSBURG

• The Hammer Builders •

DESIGNERS AND MANUFACTURERS OF THE IMPACTER

When it's a vital part, design it to be FORGED

MELTING SUPT. reports:

Soffel's EXOTHERMIC SIDEBOARDS

eliminate Hot Tops...
are easy to handle...
reduce stripping time to a minimum
and give more "out the door" products

Experience proves Soffel's Exothermic Sideboards increase yield all along the line. They require *less* set-up time, *less* track time, *less* storage space, *less* mold inventory. No crane is required–a limiting factor in conventional hot topping. Sideboards give you *more* sound steel and *more* flexibility in operations.

PRODUCT ADVANTAGES

- **Eliminate permanent and conventional hot tops.**
- **Easy, and single, stripping of Big End Down molds.**
- **Sideboards are easily placed in head of mold by one man — crane only necessary on very large ingots.**
- **Longer mold life — less mold cost — less mold inventory to carry.**

Soffel's Exothermic Sideboards increase ingot yield, assure top cut soundness and provide more ton steel out the door per ton of steel in the ingot.

Phone NAtional 5-1571

Pittsburgh Metals Purifying Co.

A Division of Treesdale Laboratories, Inc.

MARS, PENNSYLVANIA

MEETINGS

(Continued from P. 23)

headquarters, 1900 Arch St., Philadelphia.

Rail Steel Bar Assn.—Annual meeting, Apr. 17-18, Biltmore Hotel, New York. Association headquarters, 38 S. Dearborn St., Chicago.

American Welding Society—Annual meeting, Apr. 17-21, Commodore Hotel, New York. Society headquarters, 33 W. 39th St., New York 18, N. Y.

Scientific Apparatus Makers Assn.—Annual meeting, Apr. 23-27, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, 20 N. Wacker Dr., Chicago.

International Acetylene Assn.—63rd anniversary convention, Apr. 24-25, Sheraton-Plaza Hotel, Boston. Association headquarters, 270 Park Ave., New York 17, N. Y.

Assn. of Iron & Steel Engineers—Spring conference, Apr. 24-26, Jefferson Hotel, St. Louis, Mo. Association headquarters, 1010 Empire Bldg., Pittsburgh, Pa.

National Association of Secondary Material Industries, Inc. — Pacific Coast Div., regional dinner meeting, Apr. 25, Beverly-Hilton Hotel, Los Angeles, Calif. Assn. offices, 271 Madison Ave., New York 16, N. Y.

Institute of Radio Engineers—Annual conference, April 26, 27, and 28, Westward Ho Hotel, 618 North Central Ave., Phoenix, Arizona.

Society of the Plastics Industry, Inc.—18th annual western section conference, Apr. 26-28, Hotel del Coronado, Coronado, Calif. Society headquarters, 250 Park Ave., New York 17, N. Y.

National Screw Machine Products Assn. — Annual industry meeting, Apr. 30-May 3, Somerset Hotel, Boston, Mass. Association headquarters, 2860 E. 130th St., Cleveland, O.

giant guardian...

Four football fields could be laid out on the flight deck of the giant, nuclear-powered U.S.S. Enterprise—the world's largest ship. But size isn't the only dimension that makes the Enterprise outstanding. Pressurized water nuclear reactors, producing over 200,000 horsepower, will drive her at speeds in excess of 25 knots. She will be able to sail the seven seas for several years without refueling.

Carlson corrosion and heat-resistant stainless steel plate was used in this huge Attack Aircraft Carrier, and in her nuclear power plant. The builders of the Enterprise have confidence in the stainless plate produced by Carlson specialists. Exacting quality standards and dependable delivery result from such specialization.

Whether you are building a gigantic ship, a nuclear power plant, or corrosion-resistant process equipment, we can help you make it best. For practical assistance in filling your requirements for stainless plate in a wide range of grades and sizes, contact Carlson.

Our new booklet, "Producing Stainless Steels . . . Exclusively," is available. Write for your copy now.

Photograph of the launching of the U.S.S. Enterprise. Courtesy of Newport News Shipbuilding & Dry Dock Co.

OFFICIAL U.S. NAVAL PHOTOGRAPH

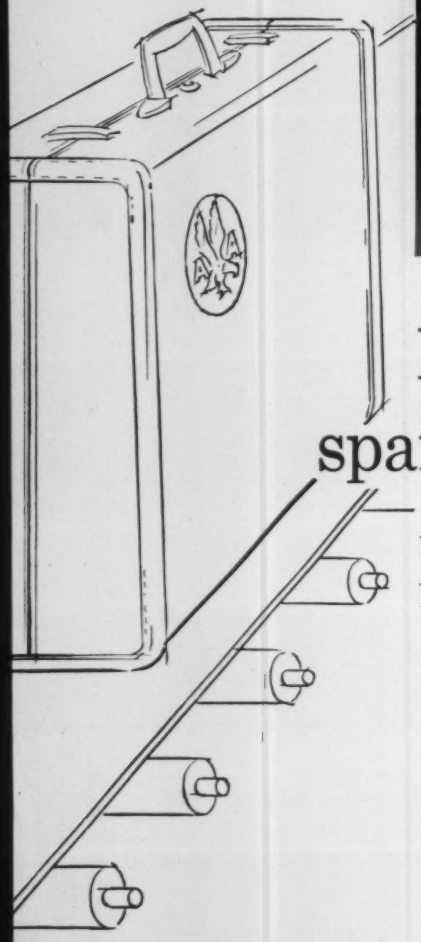
G.O.CARLSON Inc.

Producers of Stainless Steel

120 Marshallton Road
THORNDALE, PENNSYLVANIA
District Sales Offices in Principal Cities

Plates • Plate Products • Heads • Rings • Circles • Flanges • Forgings • Bars and Sheets (No. 1 Finish)

One Logan belt conveyor runs behind the American Airlines ticket desks, full length of the new terminal's 200-ft. main lobby. Ticket agents weigh and tag baggage and place it on this continuously-running line. Stainless steel kick plates give the conveyor an attractive built-in appearance and prevent accidents.



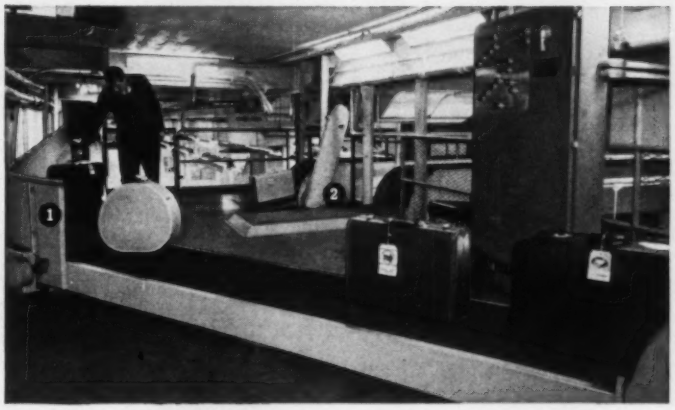
Logan *Plant Dynamation* sparks air baggage to jet pace

through the new American Airlines terminal at Idlewild

Like modern production machines, modern jet passenger planes call for new approaches to material handling. Photos on these pages show how a 700-ft. Logan *Plant Dynamation* conveyor system helps keep the baggage of 2800 daily passengers in pace with fast schedules. This feature of American Airlines' jet terminal at New York International Airport is part of the hemisphere-wide "Baggage Expediter System" for 707 Jet Flagships. The Logan conveyors have a peak capacity of 1500 parcels per hour—over 18 tons of baggage.

One chute conveyor and two inclined belt conveyors lower bags to ground level points where final sorting takes place. Bags actually enter jet planes in the molded fiber "pods" seen on the right. The movable Logan conveyor in the background quickly returns to the junction platform any bags requiring re-routing. Total time from lobby to flight pod: about five minutes.

Much outbound baggage arrives by bus and limousine. These parcels are lowered by a combination chute and belt conveyor line, direct from the terminal's front ramp to the baggage sorting junction.



One level below the main lobby, all baggage enters a suspended junction platform area where it is sorted by flight and dispatched to proper loading areas. In the photo above the conveyor from the lobby is numbered 1, the line from front ramp numbered 2. The Logan control panel at right monitors and controls the entire conveyor system.

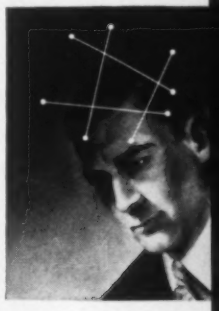
Why the leaders of so many industries call in "The Man From Logan"

Whether your problem is more like pacing suitcases through a terminal, appliances through assembly, or cookies through a bakery, the Logan field engineer takes hold like a specialist in *your* type of conveyors. There is a reason;

The Logan technique of Plant Dynamation cuts straight to the heart of any process and the individual needs of any plant. The Logan engineer helps you analyze your plant's *basic work-power patterns* . . . then moves step by step to design the one right conveyor system dictated by these patterns.

Over the half-century in which assembly-line production itself has grown up, Logan engineers have developed and proved the Plant Dynamation concept through thousands of custom installations, in a very wide range of fields. All this experience is focused on your job. On an average, "The Man From Logan" stationed near you has fourteen years of Logan training and experience.

One of the most comprehensive lines of conveyor equipment permits the Logan engineer to specify the one right system for you in every detail. Both as supplier and designer he commands five distinct modes of power and control. Every "Man From Logan" has made original contributions to modern automation.



"The Man From Logan" in your area is quickly available. He works with your engineers through design and installation to smooth operation. It is important to consult him early. Write or phone today for a conference on the *dynamation* of your plant.

Logan Conveyors

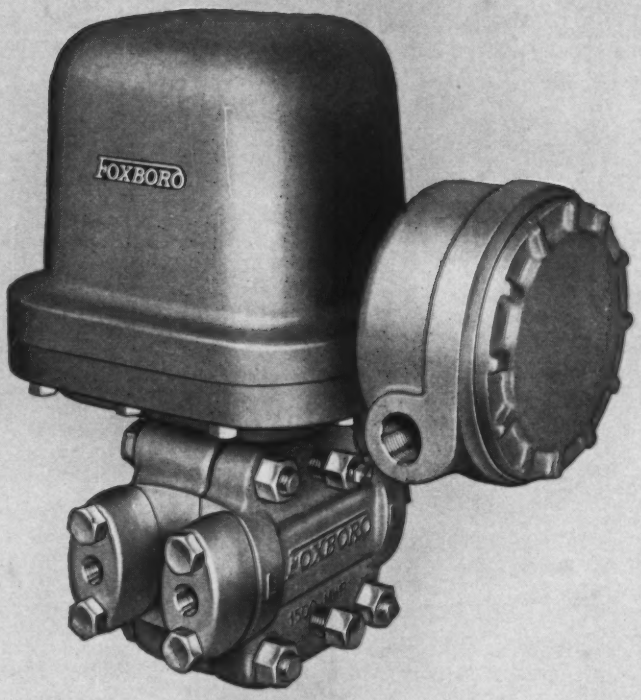
LOGAN CO., 545 CABEL ST., LOUISVILLE 6, KY.

Indicating Motion-Balance Transmitters
...for flow, pressure, and level

Thermocouple and Resistance Bulb Converters
...magnetic amplifiers
...no vibrators
...no mechanical rebalancing

Displacer Level Transmitters
...force-balance for simplicity

Control Valves
...with electro-pneumatic and electro-hydraulic actuators



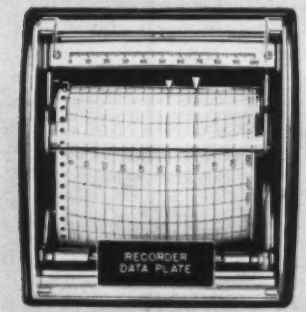
FORCE-BALANCE TRANSMITTER
The Electronic d/p Cell* Transmitter measures flow, pressure or level and converts to d-c signal. Amplifier, shown here integrally mounted, may be separately mounted in an accessible area. Combines the simplicity, sustained accuracy and repeatability of force-balance measurement with the speed and convenience of electrical transmission.

*Reg. U. S. Pat. Off.

FOXBORO Electronic

REG. U.S. PAT. OFF.

CONTROLLER
Electronic Consotrol Controller concentrates all control and supervisory functions in one slim 3 x 6 inch case. Operation is entirely independent of recorder; but both may be enclosed in a single 6 x 9 inch housing with independent pull-out.



RECORDER
Electronic Consotrol Recorder (shown ¼ actual size) uses the simple, powerful Dynatorque pen motor which can be operated directly from transmitter signal without amplification. Available in 1 or 2 pen models.

- choice of force-balance and motion-balance transmitters
- thermocouple and resistance bulb converters-using magnetic amplifiers
- long time-constant tubeless controllers

Consotrol Instrumentation

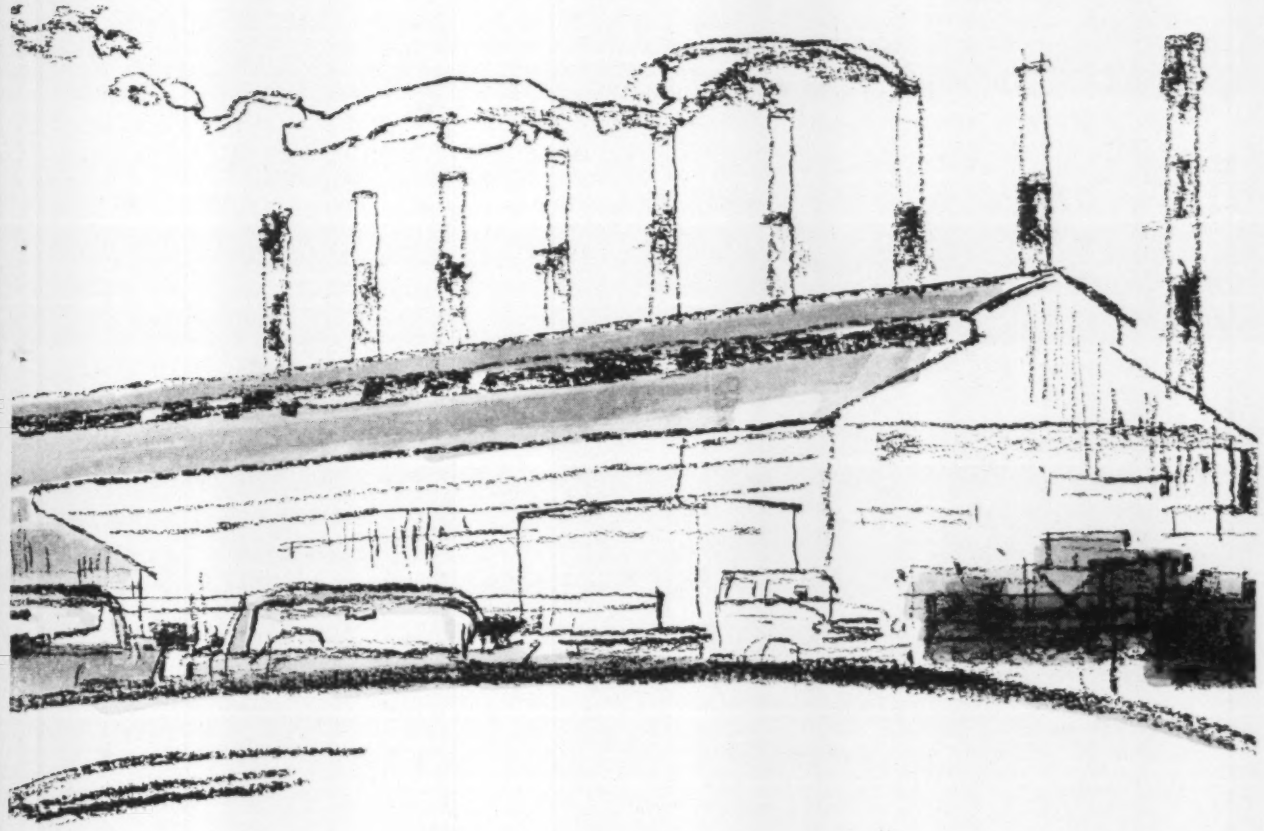
Electronic Consotrol* Instrumentation—the most complete and advanced family of electronic-operated measurement and control instruments available today! That just begins to describe Foxboro's dramatic new advance in instrumentation. ✓ ✓ ✓ Foxboro electronic transmitters, indicators, recorders, control stations, computing stations, valve actuators and other final operators cover every function in the control loop. All are linked by a d.c. current signal. All are completely tubeless. Even thermocouple and resistance-type systems no longer require vacuum tubes. ✓ ✓ ✓ Electronic Consotrol systems convert temperature, pressure, flow, level measurement, etc., to a proportional signal at the transmitter. Transmission to a remote control station is instantaneous—using an electronic motion-balance or force-balance transmitter. Designs are available for both accessible and inaccessible areas. ✓ ✓ ✓ Electronic Consotrol Instrumentation heralds a whole new era in control engineering. Write Foxboro today for 32-page Catalog 21-10 which gives full details. The Foxboro Company, 804 Neponset Ave., Foxboro, Mass., U.S.A.

*Reg. U.S. Pat. Off.

for the first time... the 100% solid state electronic system!

"Foote says Electromanganese will reduce our breakage claims . . . and lower our processing costs at the same time!"

"I don't believe it, but let's let them prove it!"

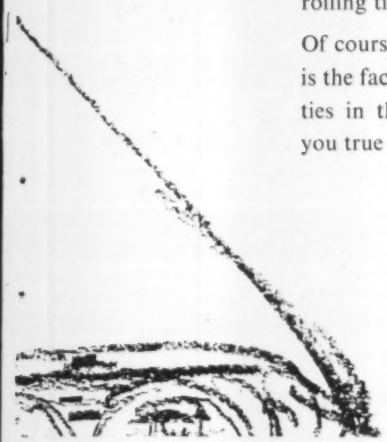


We'd welcome the chance! Because we've seen it work for so many other steel producers. They've found that Foote Electromanganese®, 99.9% pure electrolytic manganese metal, improves ductility . . . provides finer deep-drawing qualities for *their* customers, cuts down claims and rejects.

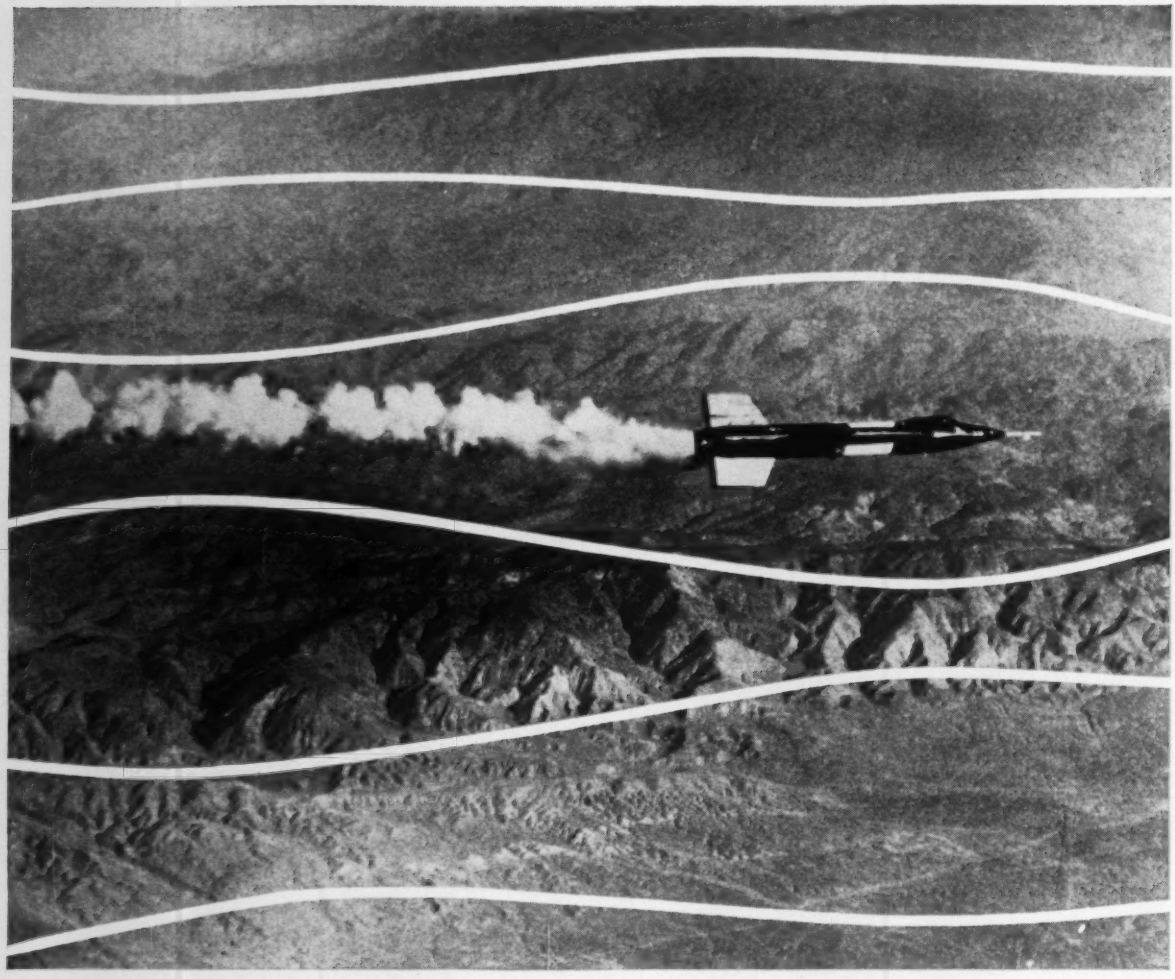
As for lower processing costs, these same producers have slightly higher ingot costs, in some cases, but realize savings in less furnace time, less annealing time, less rolling time.

Of course, the reason behind these savings is the fact that you start with fewer impurities in the ingot. Electromanganese gives you true *pin-point control* of carbon, silicon and phosphorus—enabling you to begin and end with a superior product, and greater customer satisfaction.

Let us prove it to you! Foote metallurgists will survey your problems and processing procedures, then recommend a positive solution. If you have specific quality problems in aluminum-killed, rimming, free-machining or stainless steels, now is the perfect time to test this economical solution. Write for full information, and ask for your copy of Bulletin 201, which tells all the advantages of Foote Electromanganese. Foote Mineral Company, 438 West Chelten Avenue, Philadelphia 44, Pennsylvania.



FOOTE
MINERAL COMPANY



For the star-chasing X-15

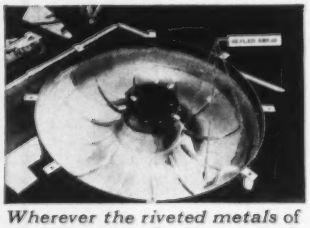
SCOTCH-WELD® SOLVES FUEL FLOW PUZZLE, SEALS PRESSURE BULKHEADS TO 3,700 PSI

BRAND STRUCTURAL ADHESIVE

One of the design puzzles North American had to solve before its X-15 could rocket into space: effective sealing of fuel tanks. Ammonia, one of the liquids which fuel the Mach-busting X-15, is carried in a compartmented tank of Inconel riveted to aluminum. Segmented bulkheads must be perfectly sealed or the fluid will not flow from one compartment to another. Of the many sealants tested, only SCOTCH-WELD Brand Structural Adhesive Film produced the seal required in the face of ammonia, other cryogenic fluids, and the extreme temperature and pressures encountered.

SCOTCH-WELD adhesives have hundreds of applications—wherever there's a problem of fastening or sealing metal to metal, or to other materials. They resist ozone, acids, water, jet fuels, other corrosives. And provide shear strength of plus 3,700 psi at 70°F., 1,650 psi at 300°F. They contain no solvents—fume disposal and drying problems don't exist! The same 3M research that created these SCOTCH-WELD adhesives can help solve the fastening problems that may be plaguing you. Why not ask your 3M Field Engineer? Or write AC&S Division, 3M Co., Dept. SBQ-41, St. Paul 6, Minn.

"SCOTCH-WELD" is a reg. TM of 3M Co.



Wherever the riveted metals of the tank meet, a SCOTCH-WELD adhesive seal provides continuous contact between mating surfaces, acts as a continuous insulating barrier of uniform thickness.

ADHESIVES, COATINGS AND SEALERS DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

Denison, Denison HydrOILics, and Multipress are registered trademarks of Denison Eng. Div., ABSCO

DENISON HydrOILics

16 different **VICTOR ADDING MACHINE** cases perforated without tooling changes, demonstrates **DENISON** Multipress...

VERSATILITY

PERFORATING *16 different plastic case designs without tooling changes, this 8-ton Denison Multipress reduces inventory requirements and speeds production for Victor Adding Machine Company, Chicago. Typical case after punching, shown at left.*

SHARPLY REDUCED inventory requirements, no scrap loss and production line versatility are just 3 of the important advantages gained with this Denison hydraulic Multipress at Victor Adding Machine Company.

Previously, stocks of at least 6 different basic plastic shells had to be maintained to produce cases for 16 different models in the Victor Champion line.

Now, with an 8-ton Multipress equipped with special tooling and controls which enable the operator to select a variety of punching combinations automatically, only *two* basic shells are required in stock. And *all* of the 16 different case design variations are perforated on the Multipress *with no change of tooling*. And the right shell is always on the assembly line at the right time.

Smooth, controlled hydraulic power perforates the "Cycolac" plastic, without charring or discoloring. Holes are clean and smooth . . . there's no scrap loss . . . punch life is significantly longer. This operation at Victor Adding Machine is another case-in-point showing how Multipress versatility and usefulness can save time and money in *your* plant. Call in the nearby Denison Production Specialist to discuss how a **M**ultipress **A**nalysis **P**rogram can start to **MAP** production savings for you now.

DENISON ENGINEERING DIVISION
American Brake Shoe Company
1242 Dublin Road • Columbus 16, Ohio

HYDRAULIC PRESSES
PUMPS • MOTORS • CONTROLS

DENISON
HYDRAULIC MULTIPRESS

Of all steel-wire manufacturers, *only* CF&I offers you high quality steel wire in all the packages shown above. These packages are designed to help you cut downtime . . . ease storage and handling problems . . . and increase daily production.

1. FIBRE DRUMS – 250-600 lbs. capacity. A sturdy container, with a center core, which holds wire of one continuous length. A metal cover and locking band seal the drum and protect the wire from atmosphere and dirt. Wire is withdrawn directly from the drum into your equipment. Two sizes: full and half drum.

2. SHAPED COILS – 1500-2500 lbs. capacity. This heavy coil contains wire of one continuous length, bundled with four steel straps. Will increase production up to 25%.

3. REEL-LESS CORE – 800-1000 lbs. capacity. Reduces shipping expense by eliminating deposit on reels and cost of returning empty metal reels. One continuous length is wound on a cardboard core. When received at your plant, the wire is placed on your aluminum, detachable-flange reel . . . ready for use.

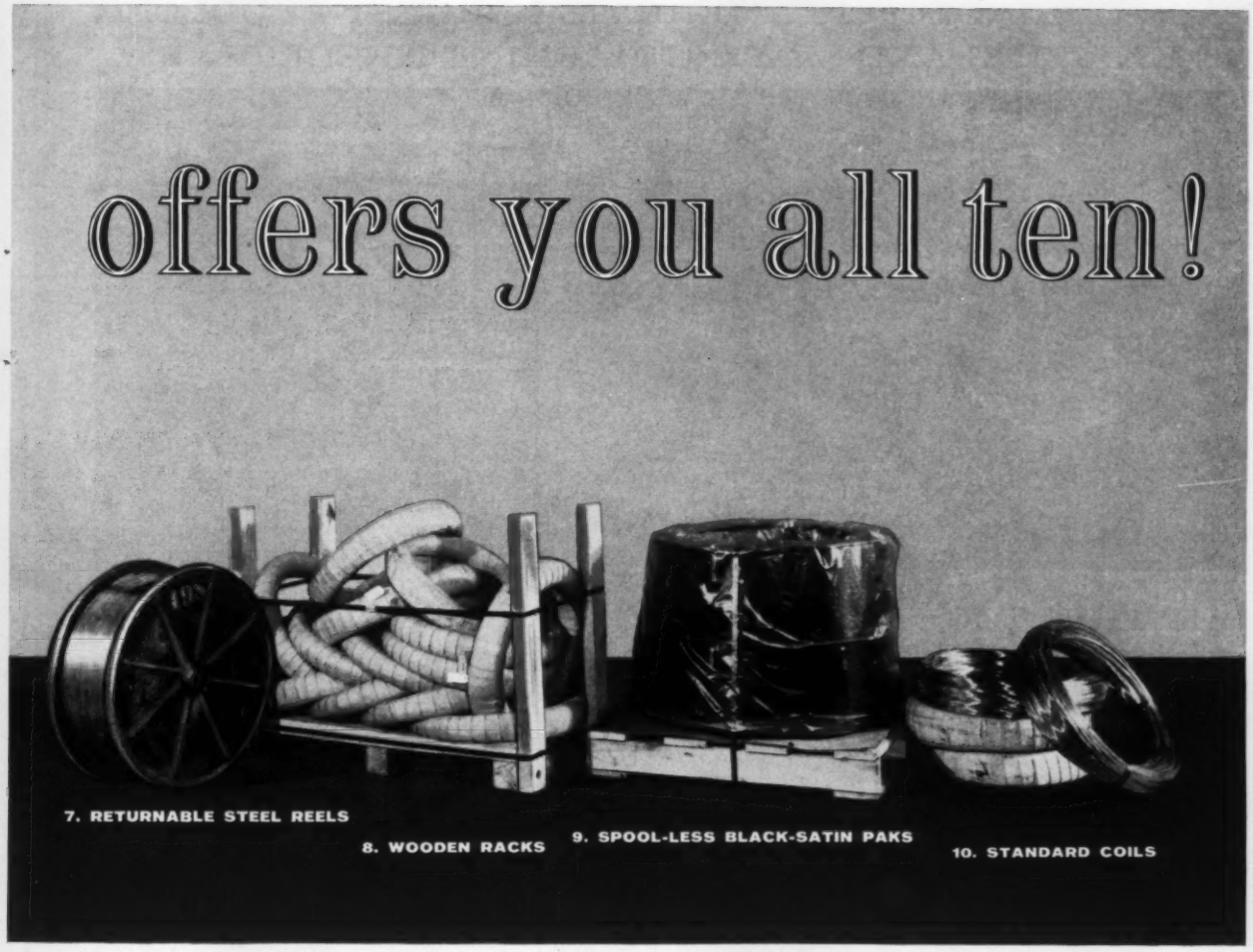
4. RETURNABLE SPIDERS – 2000-3000 lbs. capacity. A sturdy wire carrier consisting of a center core of 2″ steel pipes welded to a heavy base plate. Holds one continuous length of wire, reduces downtime and increases production.

5. DISPOSABLE SPOOLS – 5-70 lbs. capacity. Can be used once and then discarded. Has the advantage of wire on spools with no deposit, no return of empty spools.

6. DISPOSABLE STEM-PAKS® – 500-1000 lbs. capacity. One continuous length of wire on a disposable pallet consisting of a center core attached to a wooden base mounted on 4″ runners. Speeds unloading, handling and increases production.

7. RETURNABLE STEEL REELS – 500-800 lbs. capacity. Holds one continuous length of wire, ready for smooth, even pay-off. Assures you wire free from damage in transit. Because reels require

offers you all ten!



less pay-off space, valuable production area can be saved.

8. WOODEN RACKS – 1500-3000 lbs. capacity. Protects coils during shipping and simplifies in-plant handling. Eliminates need for handling individual coils.

9. SPOOL-LESS BLACK-SATIN PAKS – 2000 lbs. capacity. Provides two 1000 lb. continuous lengths of oil tempered wire wound on cardboard cores, palletized and shrouded with polyethylene. Ideal for long production runs. Cuts downtime up to 90%.

10. STANDARD COILS — 100-600 lbs. capacity. Packaged for a wide range of industrial uses. They are securely bundled and can be paper-wrapped for protection in transit and storage.

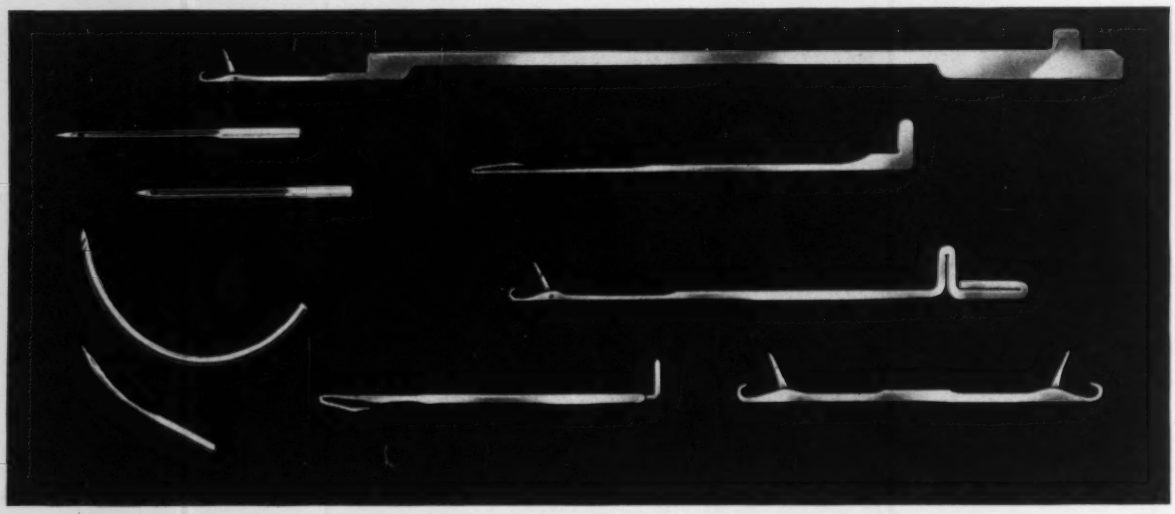
• • •

For more complete information on each of these ten wire packages, we invite you to consult your CF&I sales office.

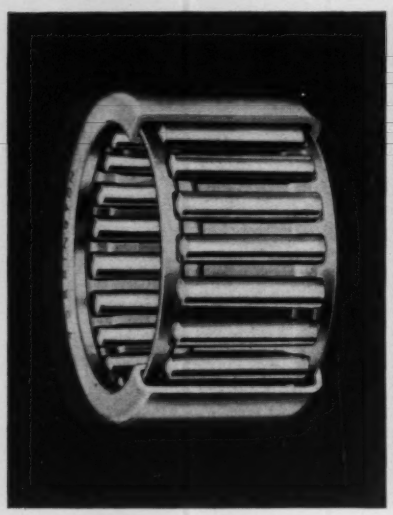
6113

THE COLORADO FUEL AND IRON CORPORATION
Denver • Oakland • New York
Sales Offices in All Key Cities

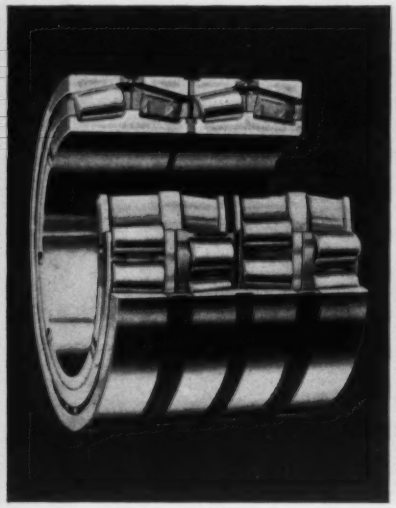
YES, TORRINGTON IS AMERICA'S LARGEST PRODUCER OF KNITTING AND SEWING MACHINE NEEDLES...



BUT THIS, TOO, IS TORRINGTON...



Pioneer manufacturer of the new Drawn Cup Roller Bearing for simplified design and increased efficiency of appliance motors, generators, and many other products.



A leading producer of 4-row tapered roller bearings specifically designed and engineered for heavy duty applications in steel, aluminum and other metal rolling mill equipment.

World's largest manufacturer of rotary swaging machines for economical chipless machining, newest of which is the versatile Electro-Hydraulic Die Closing Swager shown here.

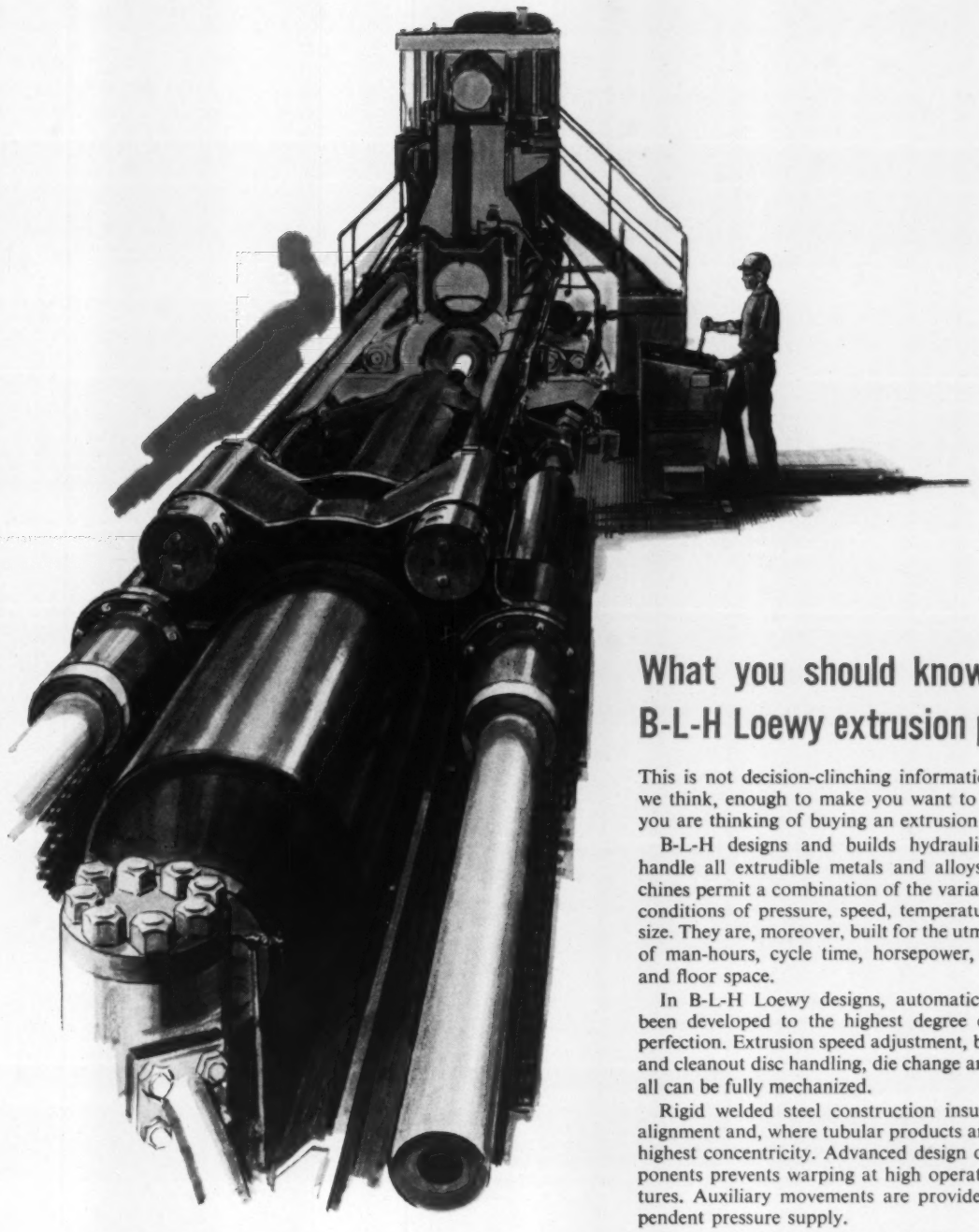
In these and many other fields throughout the world Torrington is contributing to

PROGRESS THROUGH PRECISION

THE TORRINGTON COMPANY

Torrington, Connecticut

Serving industry from plants located in the United States, Canada, England, Germany and Italy



Artist's rendering of a B-L-H Loewy water-hydraulic extrusion press

What you should know about B-L-H Loewy extrusion presses

This is not decision-clinching information. But it is, we think, enough to make you want to consult us if you are thinking of buying an extrusion press.

B-L-H designs and builds hydraulic presses to handle all extrudible metals and alloys. These machines permit a combination of the variable operating conditions of pressure, speed, temperature and billet size. They are, moreover, built for the utmost economy of man-hours, cycle time, horsepower, maintenance and floor space.

In B-L-H Loewy designs, automatic control has been developed to the highest degree of functional perfection. Extrusion speed adjustment, billet, dummy and cleanout disc handling, die change and rotation—all can be fully mechanized.

Rigid welded steel construction insures precision alignment and, where tubular products are concerned, highest concentricity. Advanced design of press components prevents warping at high operating temperatures. Auxiliary movements are provided with independent pressure supply.

For detailed information, write Dept. A-4.

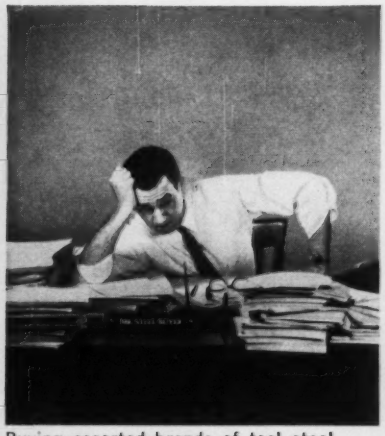
BALDWIN · LIMA · HAMILTON

Industrial Equipment Division · Philadelphia 42, Pa.

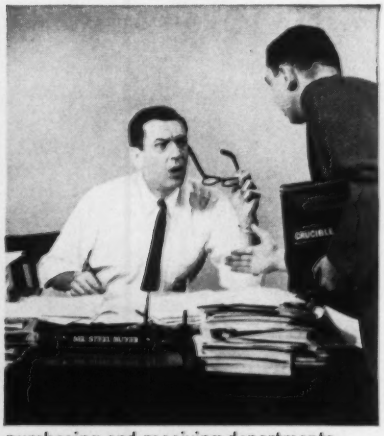
BALDWIN BLH LIMA-HAMILTON

NEW TOOL STEEL SERVICE

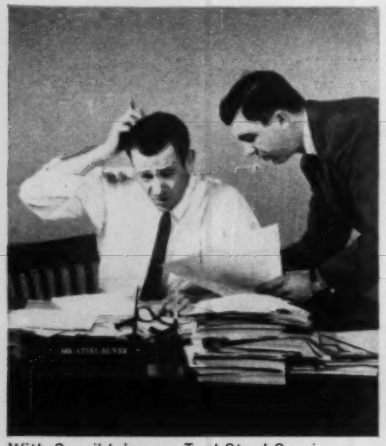
simplifies purchasing (and saves money, too)



Buying assorted brands of tool steel creates costly paperwork for your . . .



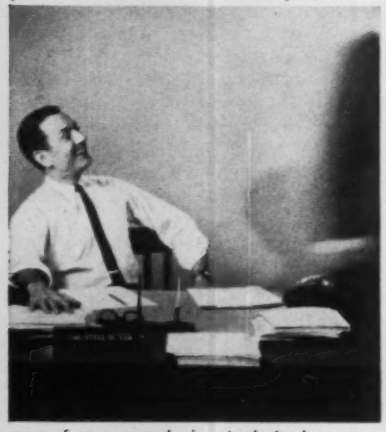
purchasing and receiving departments — manufacturing and accounting, too.



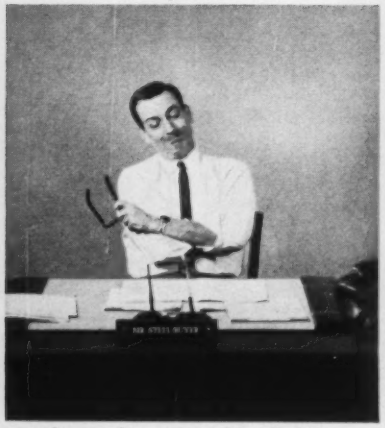
With Crucible's new Tool Steel Service you cut these costs substantially

because you buy fewer grades of tool steels to do more jobs . . .

eliminate piles of paperwork throughout your plant . . .



carry fewer pounds in stock (reduce chances of inventory "mix-ups"), and . . .



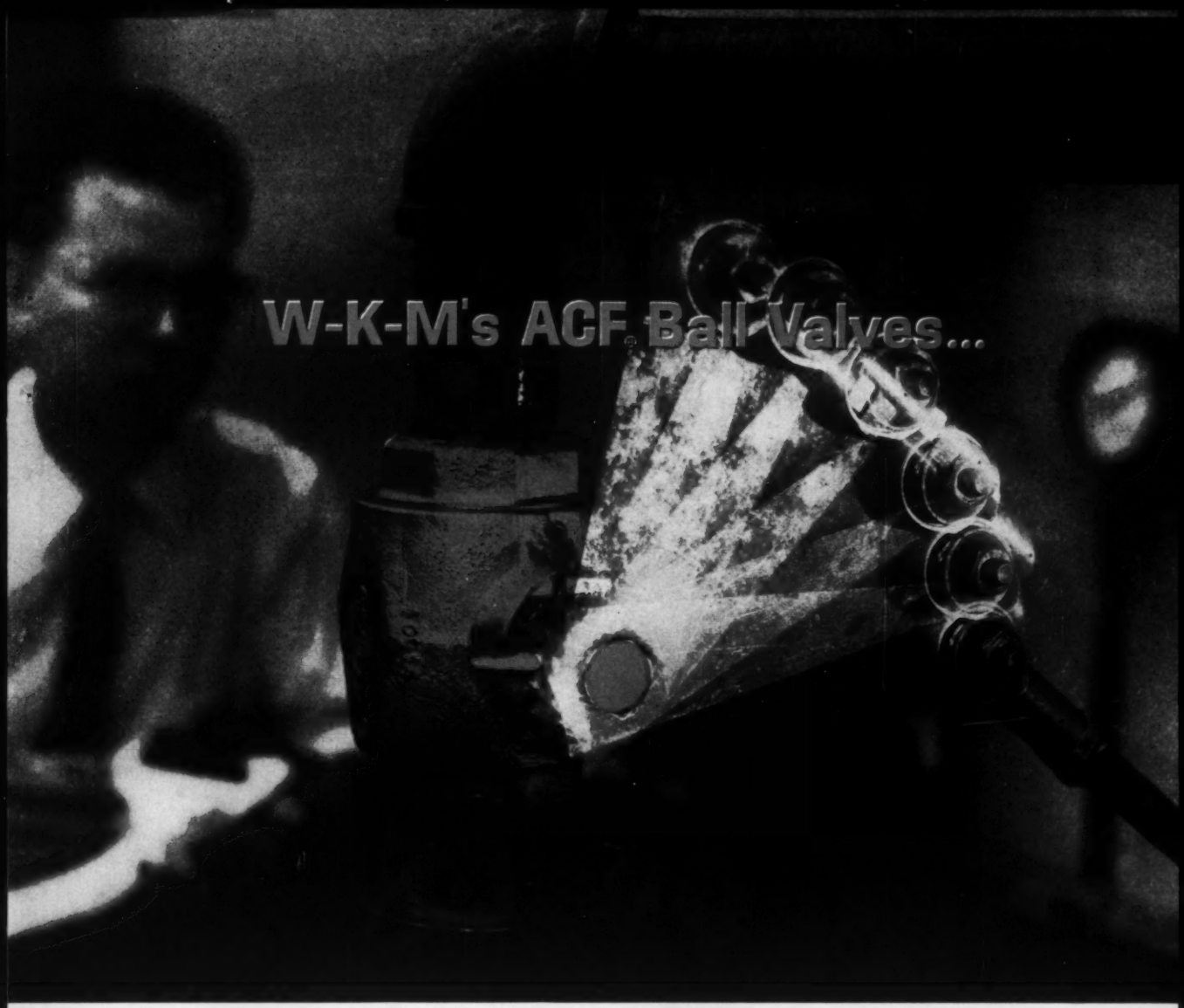
pay a lower price per pound (by eliminating costs for small quantity "extras").

MORAL

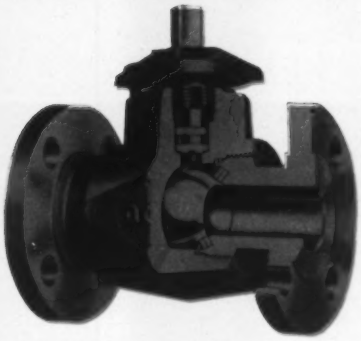
You benefit with Crucible's new Tool Steel Service. For the full story, call in a Crucible Service Engineer.

CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Caldwell, N. J. • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Erie, Pa. • Grand Rapids • Houston • Indianapolis • Los Angeles • Miami • Milwaukee • Minneapolis • New Haven • New York • Philadelphia Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis • E. Syracuse • Tampa • Toledo • Tulsa
CRUCIBLE STEEL OF CANADA, LTD., SOREL, QUEBEC, CANADA



LEAKPROOF AFTER 600,000 CYCLES!



Proved in the laboratory, and in over five years of field service with such difficult ladings as acetone, propane, vinyl chloride, and lime and soda-ash slurry, W-K-M's ACF Ball Valve has earned a reputation for extra long life *without lubrication*. For example —

In one test, W-K-M opened and closed a 2″ standard production model under pressure 600,000 times. The valve still sealed tight, and there was no measurable wear on either the chrome-plated ball or the Teflon seats!

W-K-M's rugged ACF Ball Valves are available in carbon steel to ASA 300 lbs. (some sizes 600 lbs.), and in semi-steel, ASA 200 and 400 lbs. WOG.

Write for Catalog 1000.

Conduit is full-bore; Teflon stem gaskets and seats are sealed from the lading flow.

WHEN SO MUCH DEPENDS ON A VALVE . . . SPECIFY ACF BALL VALVES

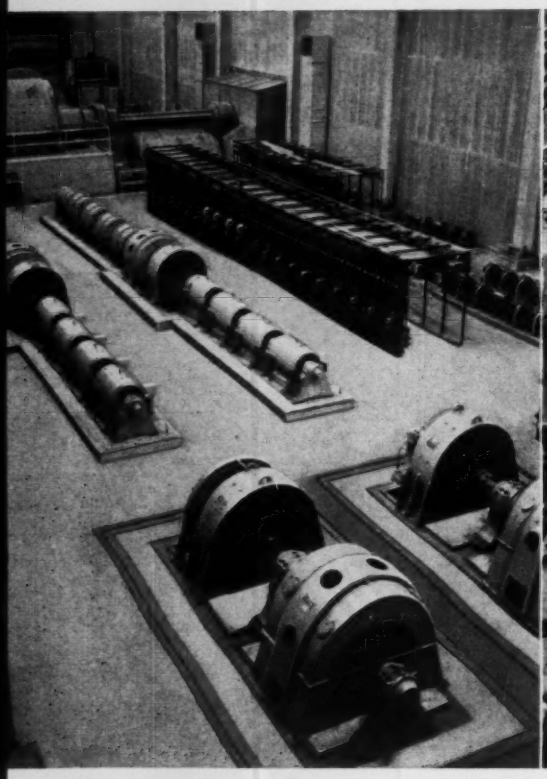
W-K-M

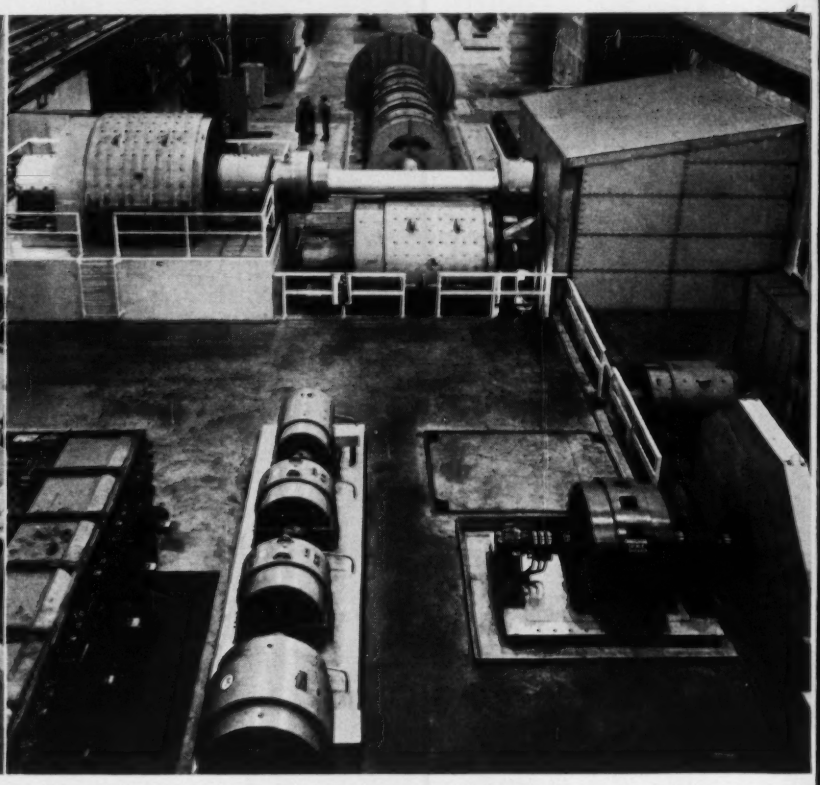
DIVISION OF ACF INDUSTRIES
INCORPORATED
P. O. BOX 2117, HOUSTON, TEXAS

6006

Pick a process...any mill process...and discover the dynamic Allis-Chalmers leadership in

Power for Steel





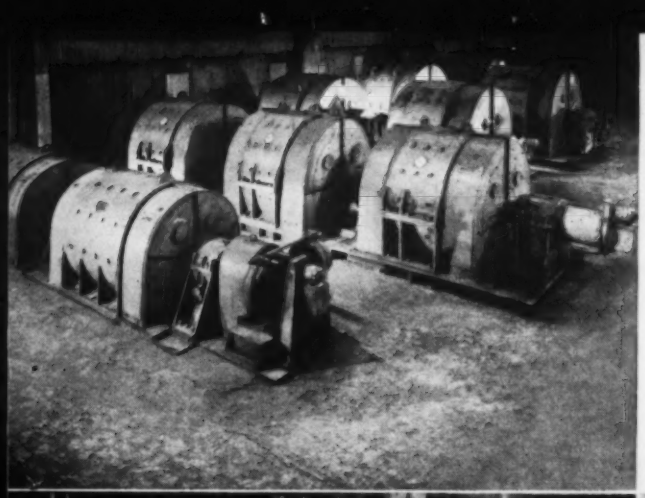
Allis-Chalmers power serves blooming mill: Installed in 1953, the 45-in. by 115-in. blooming mill at Granite City Steel operates as a high-lift slabbing mill. It's powered with an Allis-Chalmers 10,000-hp twin drive, 40/80-rpm reversing motor. Additional A-C equipment includes switchgear, direct-current control, constant and variable-voltage m-g sets, and REGULEX exciter sets.

Hot strip mill upgraded: Granite City Steel's hot strip mill has been continuously upgraded to increase tonnage and quality. A four-stand finishing train, installed in 1936, was upgraded in 1941 with the addition of a fifth finishing stand. In 1952, a three-high rougher was replaced with a four-high reversing rougher — horsepower was increased from 3000 hp to 7000 hp plus a 1000-hp edger. Horsepower of the finishing train was later increased by raising bus voltage from 600 to 650 volts. Now, an Allis-Chalmers feedback automatic gage control is being installed to increase quality of strip.

Throughout the mills at Granite City Steel are numerous examples of Allis-Chalmers leadership and experience in power for steel. A-C equipment is used in virtually all operations—rolling mills, processing lines, sintering plant, and power plant. All demonstrate the extra value that is standard with A-C products, systems and services. Allis-Chalmers can also help you serve tomorrow's changing markets profitably. See your A-C representative or write directly to Allis-Chalmers, Industries Group, Milwaukee 1, Wisconsin.

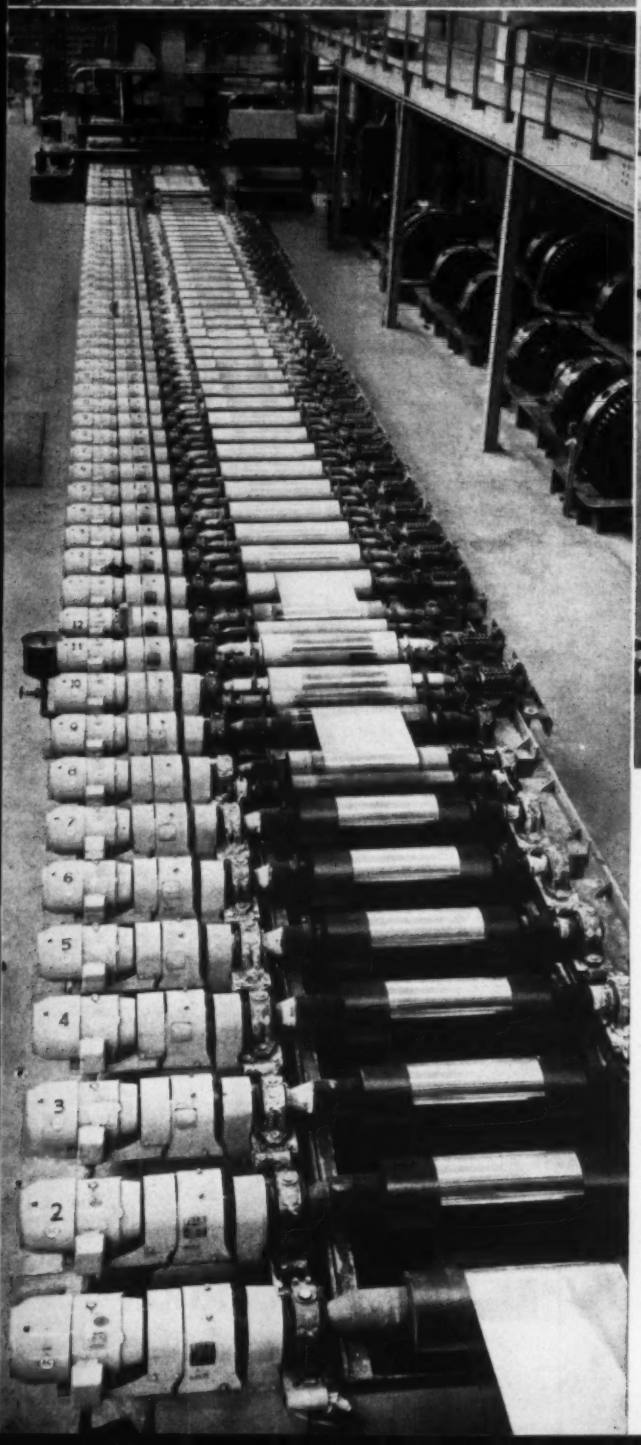
A-1454

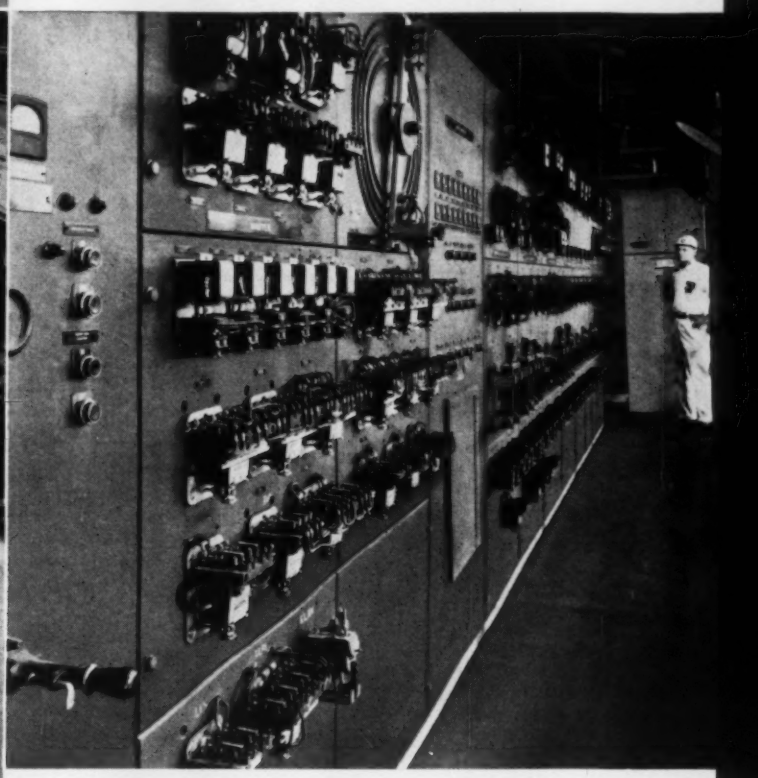
Regulex is an Allis-Chalmers trademark.



A-C cooperation limits "changeover" downtime: In 1958, Granite City Steel's four-stand cold strip mill was modernized to increase sheet-gage tonnages by 35%. Downtime for the changeover (from 9600 hp at 2800 fpm to 18,700 hp at 3600 fpm) was three weeks. A-C installed motors, m-g sets and 400-cycle control. Now being constructed are the motors, control, and a feedback automatic gage control for a new 40-in. Sendzimir mill.

Allis-Chalmers powers shearing line: Allis-Chalmers direct-current adjustable-voltage control and direct-current drives provide accurate shearing of sheets at speeds up to 1000 feet per minute. A magnetic piler, incorporated in this line, assures careful handling of sheets.





Sixty-eight motors power plating rolls: When this electrolytic tinning line went into operation in 1960, sixty-eight 5-hp Allis-Chalmers totally enclosed, fan-cooled dc gearmotors powered the plating rolls. Additional Allis-Chalmers motors and supporting motor-generator sets provide power throughout the line. Allis-Chalmers motors and supporting variable-voltage motor-generator sets also serve a high-speed continuous annealing line at Granite City Steel Company.

ALLIS-CHALMERS PRODUCTS FOR THE STEEL INDUSTRY: Allis-Chalmers serves the steel industry with motors, m-g sets, engine-generator sets, controls, rectifiers, switchgear, transformers, circuit breakers, steam turbine generators, condensers, compressors, pumps, materials handling equipment, crushers, grinding mills, kilns and screens.

ALLIS-CHALMERS

N-A-XTRA 100

NOW CODE-APPROVED FOR DESIGN OF UNFIRED PRESSURE VESSELS

A.S.M.E. CASE NO. 1297. Code approval granted by the American Society of Mechanical Engineers now makes N-A-XTRA 100 steel the logical material for use in unfired pressure vessels. This high-strength steel is fully quenched and tempered—permits greater savings and efficiency in fabrication, erection, handling, welding and shipping. Its high strength/weight ratio cuts dead weight. It cold forms readily, welds under constrained conditions without underbead cracking. These benefits are the result of the outstanding characteristics of N-A-XTRA 100 . . .

MECHANICAL PROPERTIES

Tensile Strength, psi	115/135,000
Yield Strength, psi	100,000 min.

Notch toughness at exceptionally low temperatures

CHEMICAL COMPOSITION

Carbon	.15/.20
Manganese	.80/1.10
Phosphorus, max.	.035
Sulphur, max.	.040
Silicon	.50/.80
Chromium	.50/.80
Molybdenum	.18/.28
Zirconium	.05/.15

Make a note now. For larger, stronger or lighter pressure vessels—from mobile tankers to stationary storage tanks—specify code-approved N-A-XTRA 100.

Great Lakes Steel Corporation
Product Development, Dept. IA-6
P. O. Box 7310
Detroit 2, Michigan

Please send me complete copy of the A.S.M.E. Code Case No. 1297.

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GREAT LAKES STEEL

DETROIT 29, MICHIGAN

Great Lakes Steel is a division of

NATIONAL STEEL CORPORATION

Reinforcing Rod Plant UPS PRODUCTION 300%

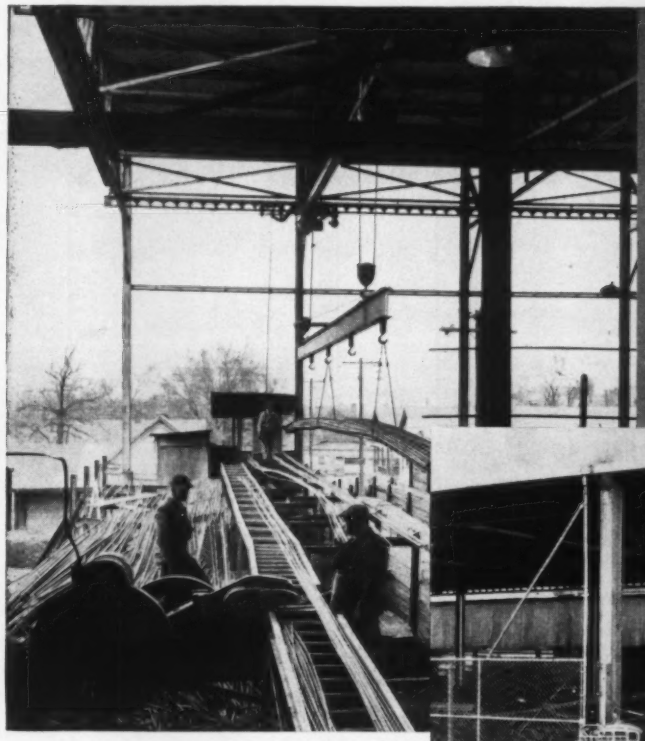
Cleveland Tramrail System Pays For Itself In 6 Months

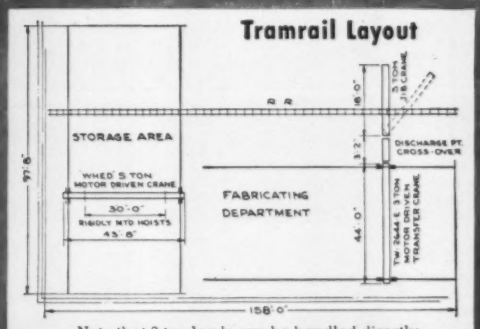
AFTER a reinforcing rod plant built a new building and equipped it with Cleveland Tramrail cranes, manufacturing costs took such a nose dive that they would make any cost-conscious plant manager blink with amazement.

Whereas eight men were required to work 8 hours to unload a 50-ton car of rods in the old building, two men using Tramrail cranes now do the job in 30 minutes. The Tramrail equipment has enabled doubling the production, and at the same time reducing man-hours by one-half. In other words, the production per man-hour is four times what it formerly was.

The savings have been so phenomenal that the entire Tramrail system was paid for in the first six months of operation.

Nearly every industry is securing important advantages with Cleveland Tramrail equipment. A nearby Tramrail sales engineer will gladly suggest ways that savings can be made in your plant.





Note that 3-ton loads can be handled directly between jib crane and 3-ton transfer crane.

5-ton crane handles 60'-0" long bundles of rod from railroad car to storage and to shear.

Outgoing truck is quickly loaded with 3-ton crane.

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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

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THE CLEVELAND CRANE & ENGINEERING CO.
4803 East 290th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Get cost-cutting

engineering help when you specify extruded aluminum products

Call in your nearby independent fabricator . . .

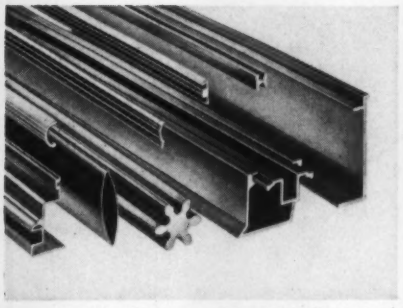
Supplied with quality ALCAN aluminum by Aluminium Limited

The practical everyday help you need in aluminum application may be just around the corner—at your nearby aluminum extruder.

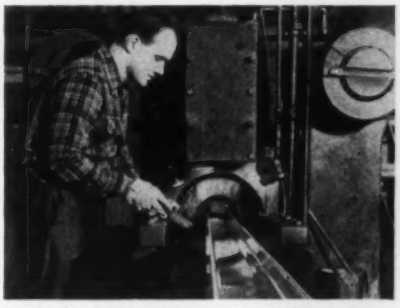
You'll find he's experienced! With knowledge gained through years of working with aluminum—he can help you design extruded shapes best suited to trouble-free production . . . peak end-product performance. He can help in alloy selection, too, offering you a wide variety of aluminum alloys formulated by Aluminium Limited.

Your independent aluminum extruder also offers more personalized service . . . your business is important to him. Even on small orders, he will give you the quality work, attention to detail and prompt delivery that assure your repeat orders.

Call in your aluminum fabricator on your next extrusion order. Let him estimate on cost and delivery. Or, if you prefer, we'll be pleased to send you a list of leading independent aluminum extruders in your area.



Any shape . . . the right alloy. Your nearby extruder can turn out aluminum in a wide range of shapes to meet your most exacting requirements. He also works with you in choosing from a variety of ALCAN aluminum alloys.



Modern equipment. Investigate the facilities offered by your aluminum fabricator—you'll find him well equipped to serve you. His facilities, experience, location, and his personalized service make him your best source of extruded aluminum products.

Fast, reliable delivery. Because he's nearer to your plant, your aluminum fabricator can arrange production schedules to suit your needs. He can also work more closely with you in estimating, planning and engineering.

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Gentlemen: Kindly send me a list of independent aluminum extruders in my area.

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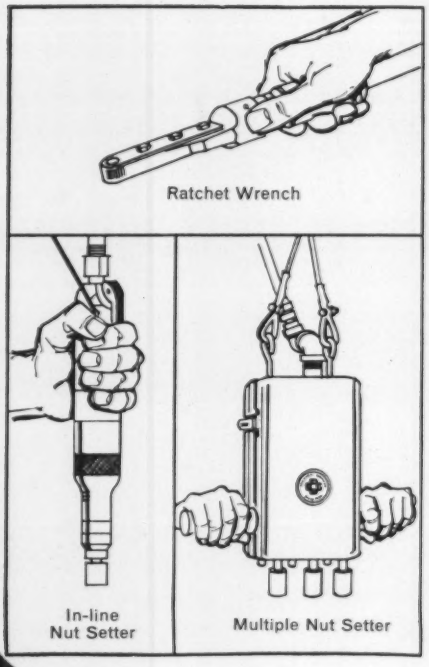
Firm_____

Address_____

City_____ Zone____ State_____



for nut setting . . .

Add skill to these hands with the right air tools

Nut setting—or *any* production fastening job—Gardner-Denver can provide exactly the right air tool to keep expensive hands working at top efficiency. Each air motor size provides the basic "building block" for hundreds of different tools. Thus, you're assured of complete versatility and interchangeability so vital to ever-changing production methods. For details, see your Gardner-Denver air tool specialist or write for Section 16 bulletins.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

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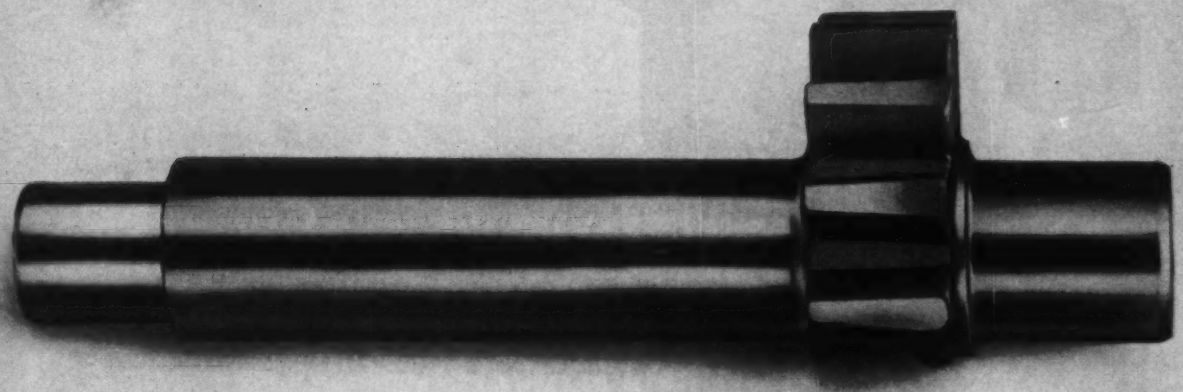
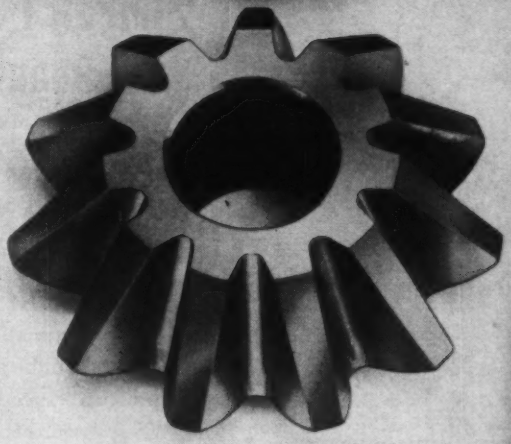
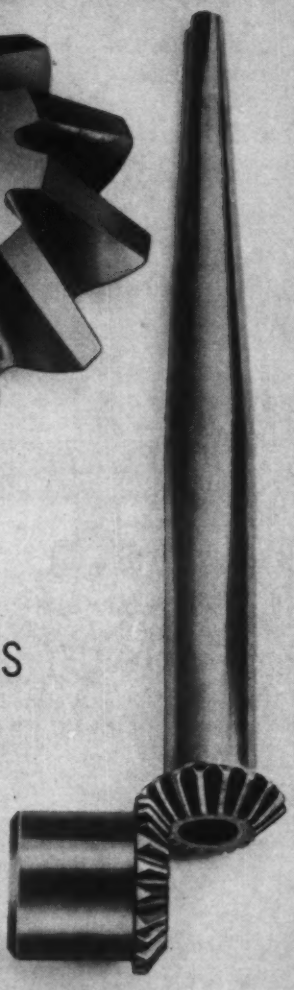






THE Gleason Revacycle® method and its machine present the fastest way known for cutting precise straight bevel gears.

The Revacycle cutter holds roughing, semifinishing, and finishing blades. One revolution of the cutter completes a tooth space in 2.5 seconds. In fact, on smaller pieces, you can complete as many as four tooth spaces with a single cycle . . . that's less than ½ second per tooth!

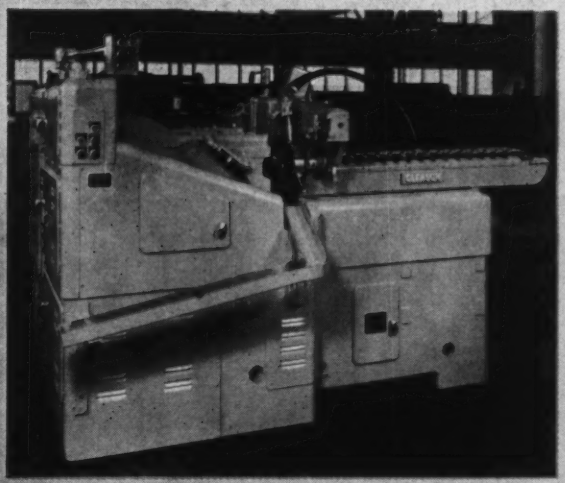
This completely automatic Gleason machine can frequently replace a tandem of roughing and finishing machines . . . thereby saving considerably on capital investment.

Best of all, to get this speed and economy you need sacrifice nothing in accuracy. The Revacycle method produces localized tooth bearing which permits any practical assembly tolerances while avoiding load concentration at the ends of the teeth. And, you get exact reproduction piece after piece, day after day.

The machine accepts a wide range of work: diameters up to 10″ at a 5 to 1 ratio and face widths up to 1.25″.

For complete background and data, write for a bulletin. Gleason engineers will help you with details on any specific applications.

How to cut a bevel gear tooth in 2.5 seconds



1.2 SECONDS is all it takes to dechuck a finished piece and chuck in a new blank with the automatic loading attachment on the 109 Revacycle Machine.

GLEASON WORKS

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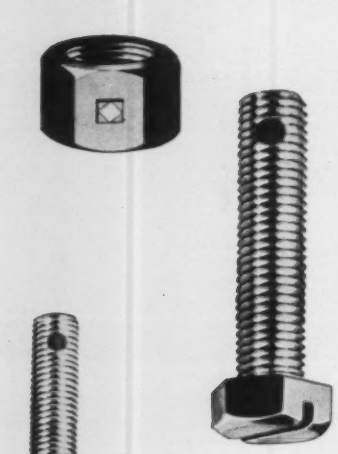


SOLVE FASTENER PROBLEMS CAUSED BY SHOCK OR VIBRATION...

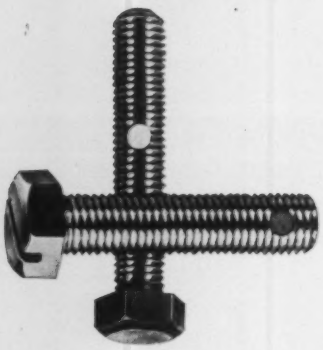
SIMPLIFY ASSEMBLY

with Republic NYLOK® Bolts and Nuts

Applications are unlimited for rugged, self-locking Republic NYLOK® Bolts and Nuts. They lock tight—seated or not—to simplify assembly, solve a wide range of design and engineering problems caused by shock or vibration.

Single-unit NYLOK Bolts and Nuts are easy to apply manually or automatically, can be used over and over. NYLOK Nuts are double-chamfered to permit automatic feeds at top production speeds, save time and money.

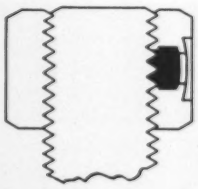
Check your product for applications where NYLOK's positive holding power can do the job better, save you money. For sizes, prices, and application data on NYLOK Bolts and Nuts, contact your Republic Dealer, or send the coupon.



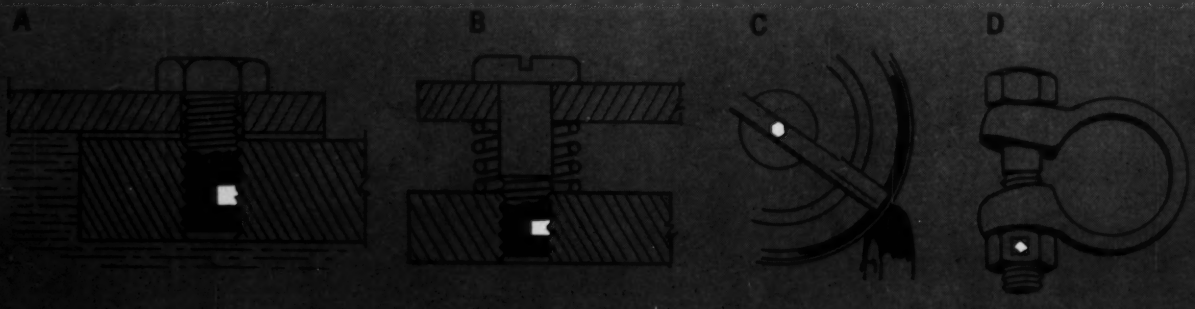
Steel Strong, Modern, Dependable

NYLOK'S SUPER-LOCKING SECRET

is its nylon plug, firmly staked into one of the faces of the cold forged hex nut, or into the body of the bolt. The plug has a plastic memory—or a natural tendency to recover its original shape and "grow" into opposite mating threads. This forces tight metal-to-metal contact for a vibration-proof lock that can't shake loose.



Typical NYLOK applications: (a) NYLOK Bolt as a fastener-sealer to effectively block fluid escape along thread path; (b) NYLOK Bolt used to solve tension or vibration fastening problems; (c) NYLOK Nut used to secure lawnmower rotor blade under severe vibration conditions; (d) NYLOK Nut employed to lock tight against pressure of a spring-clamp.

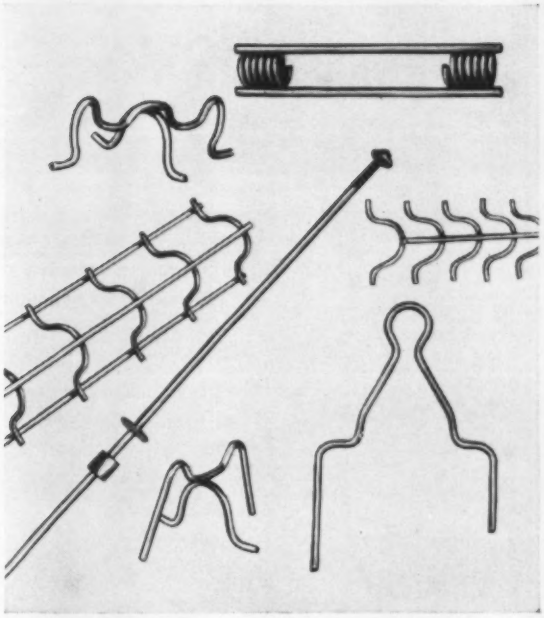


PROBLEM-SOLVING KNOW-HOW and EXPERIENCE have made Republic a leader in custom production of Fastener and Formed Parts "Specials." Whenever standard fasteners or formed parts can't do the job, you'll save time and money by contacting Republic.

Republic will handle the complete job—design, engineering, and production—or any phase of it. Extensive capabilities result from modern forming, extruding and upsetting equipment —plus complete machining, heat treating, and surface finishing facilities. Send coupon for data.

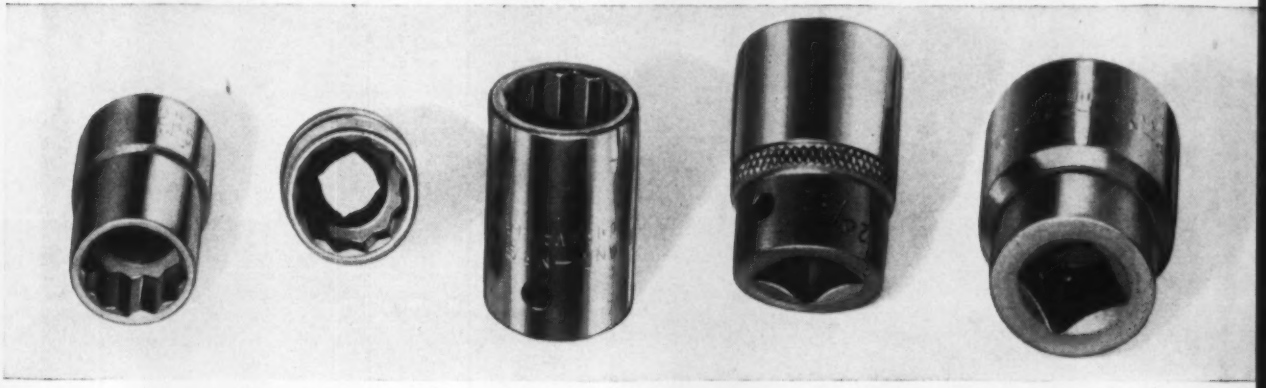
SUPERIOR STRENGTH, TOUGHNESS, and MACHINABILITY of Republic Cold Finished Alloy Bars enable Herbrand Division of the Bingham-Herbrand Corporation, Fremont, Ohio, to make a better product at lower cost.

In the production of wrench sockets, bars are formed, drilled, and cut off in an automatic screw machine, then hot broached to shape internal diameter and contour. Final stages of socket production include heat treat and chrome plating. Mail coupon for more data on Republic Alloy Bars.



ACCURATE, EASY-FORMING CHARACTERISTICS of Republic Manufacturers' Coarse Wire have simplified production and helped keep prices competitive on masonry construction accessories made by Meadow Steel Products Inc., Birmingham, Alabama.

Using Republic's free metallurgical services, Meadow determined the best wire for each product application, applied cost factors, and now makes more than 20 different parts from relatively few different types of Republic Wire. Result: reduced inventory requirements, lower manufacturing costs. Send for information on Republic Wire and Wire Metallurgical Services.



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- ☐ Manufacturers' Coarse Wire
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- ☐ Fastener and Formed Parts "Specials"
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Since 1945...

not a cent to maintain refractory concrete slow-cooling pits

For fifteen years these slow-cooling pits have been absorbing sudden thermal shocks as red-hot railroad axles are lowered into them. And with no maintenance required! Pits like these, constructed with LUMNITE calcium-aluminate cement and suitable aggregates, have low volume change which makes the concrete highly resistant to heating-cooling cycles. The monolithic walls have no vulnerable edges or joints that can be battered during charging and unloading. Construction of refractory concrete pits is economical, too. No skilled labor is required; reinforcing is easily built in; and concrete reaches service strength in 24 hours.

For greater convenience, castables containing LUMNITE cement are available from leading manufacturers of refractories. These are packaged mixtures, ready to use. Just add water, mix and place. For information write Universal Atlas Cement, 100 Park Avenue, New York 17, N. Y.

Nine of these slow-cooling pits, constructed with LUMNITE cement, have established service records at the Wheel and Axle Division of U. S. Steel's Homestead District Works. Pits measure 14'x14'x6' inside; walls taper 12" to 20" thick, top to bottom. Built by Rust Furnace Co., Pittsburgh.

Universal Atlas Cement
Division of
United States Steel

L-212

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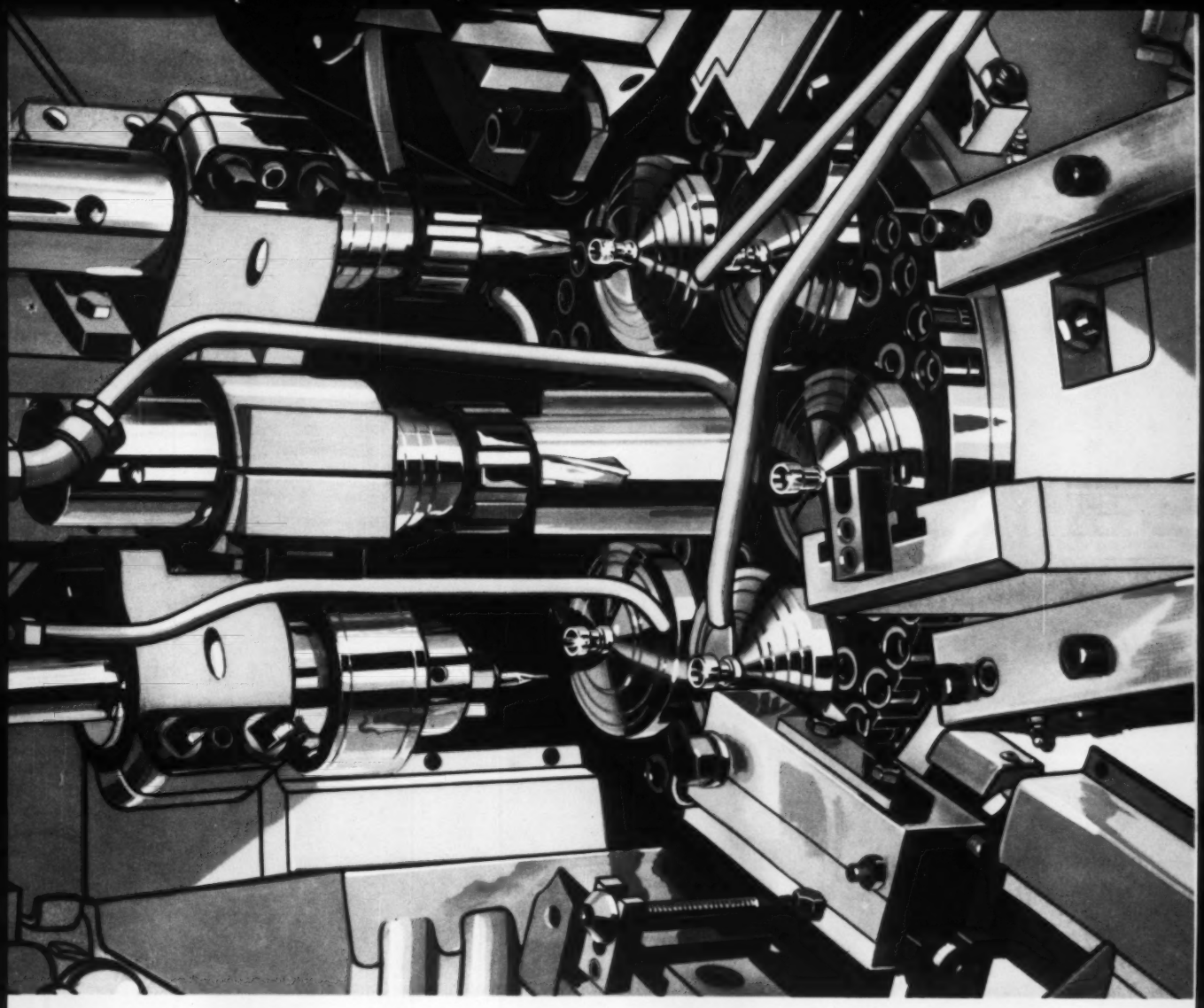


The newest bar machines *are New Britains*

How much work can you wring out of a bar machine? It depends on the machine, how it's tooled and who's using it. New Britain's New-Series Bar Machines are setting some pretty enviable productivity records right now. These machines, redesigned from the ground up, are the most advanced units of their kind available to the metalworking industry.

The four-spindle machines have capacity up to 5⅛″ and all the massiveness and power needed to turn work of this size.

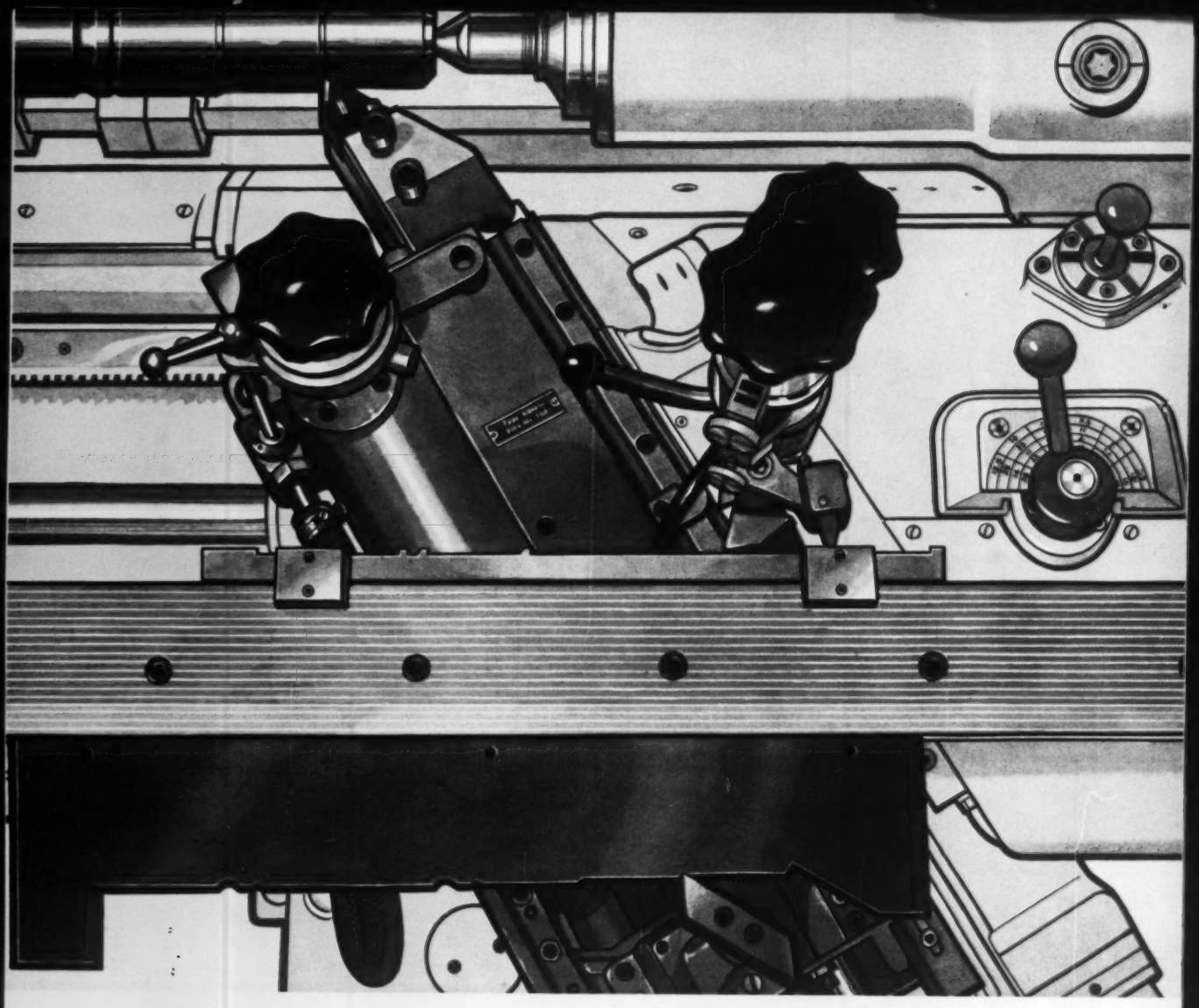
New series six-spindle machines in various models have capacities ranging up to 3½″. The eight-spindle machines take work to 2⅝″ capacity.

Increased capacity is only part of the story. Tooling combinations are practically limitless. With end-working and cross slide tooling in every position on every model, the greatest possible variety of operations can be performed to the highest order of accuracy. Numerous familiar New Britain features, like spindle carrier lifting and locating, have been retained and improved. A great many exclusive new features have been added.

Why not send for our new catalogs which give the whole story in detail or call your New Britain representative to arrange a demonstration?

THE NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division ◆ New Britain, Connecticut



Fast set-up, quick changeover *with New Britain +GF+ copying lathes*

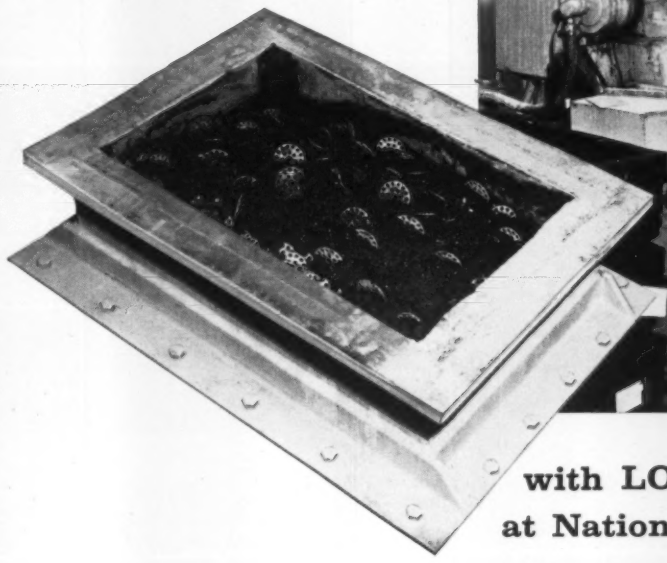
The basic design of a New Britain **+GF+** copying lathe can start to save you money on the first job you put on it. Because the single tool is guided by either a prototype or a template, set-up time is reduced to minutes. The single tool can be changed in minutes, too. Every dimension is positively transmitted from template or prototype to the work, making adjustment a simple matter of bringing only one dimension to size. A **+GF+** does a great variety of work—shafts, chucking work, internal *and* external copy turning. Backfacing is accomplished by a simple attachment. Multi-cut recycling for the removal of heavy stock concentration can also be provided.

The versatility of application is pretty much limited only by the ingenuity of the individual. For more complicated jobs, New Britain can provide the most complete selection of steadies, special tooling attachments and other accessories available for any lathe anywhere. A complete range of models and sizes is available. Why not write for our new **+GF+** copying lathe catalog?

THE NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division • New Britain, Connecticut

$108,000 SAVED IN ONE YEAR



with LORCO® vibratory processing at National Cash Register Company

It takes a heap of gears, pinions, levers, bearings, ratchets, contacts and other small parts to make a cash register, accounting machine or any of the other items of equipment manufactured at the National Cash Register Co. plant in Dayton, Ohio.

And it takes a heap of processing to deburr, radius, finish and otherwise prepare these parts for assembly into the finished product.

Even with Lorco vibratory finishing equipment 5 vibrators operate 24 hours a day to handle the 414 different parts now processed in Lorco equipment and to run tests on hundreds of other parts that are candidates for vibratory finishing.

But, compared to conventional barrel finishing and manual methods such as filing, grinding and brushing, Lorco vibratory finishing has effected a heap of savings—$108,000 in one year on 375 parts.

The other 39 parts which are processed in the vibrators receive the processing as an additional step to improve performance of the end product.

And this is an important part of the Lorco story—vibratory finishing gives you the finish you need. Thorough deburring, precise micro-inch finishing, accurate radiusing, close tolerances—all these you get with Lorco vibratory finishing, plus savings in time and in money.

Call on your Lorco engineer for the practical solution to finishing your "problem" parts. Or write today for details of Lorco experimental finishing service and media and compounds for precision barrel and vibratory finishing.

LORD CHEMICAL and EQUIPMENT DIVISION
OF WHEELABRATOR CORPORATION
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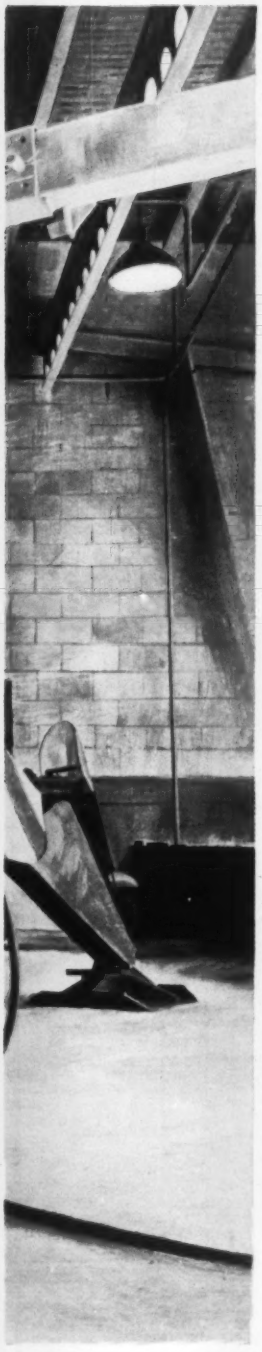
Mobil cuts costs at Chain Belt

At its Milwaukee plant, Chain Belt employs 28 in-plant materials handling units such as this vehicular crane. About two years ago, by changing to premium Mobil motor oil and grease, Chain Belt was able to extend oil change and greasing intervals on this automotive equipment. Resultant reduction of oil changes and grease jobs, plus oil filter savings, has amounted to $905.

Mobil

...latest savings $14,679!

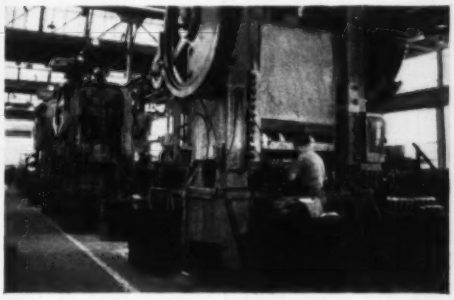


Having produced savings at Chain Belt Company for 20 years, the Mobil Program continues to cut lubrication costs further, reduce parts failures even more . . . has saved an extra $14,679 in the past 3 years!

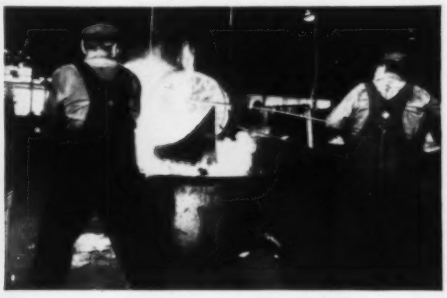
The broad scope of Chain Belt's operation poses complex and unusual lubrication problems. One of the world's largest manufacturers of chains and sprockets and a pioneer in the field of power transmission, this Milwaukee company is also a leading producer of bulk material handling equipment, water sewage and waste treatment equipment, construction machinery and self-aligning roller bearings.

20 years ago, Chain Belt became one of the first industrial concerns to adopt the unique maintenance concept pioneered by Mobil—the Mobil Program of Correct Lubrication. Through Program methods, including a periodic review of oil analysis results, purchase practices, and lubrication intervals, Mobil Engineers continue to produce more efficient operation and new savings in a wide variety of areas. Overall, Chain Belt has effected savings of $14,679 in the past 3 years. Details of specific savings are discussed on these pages.

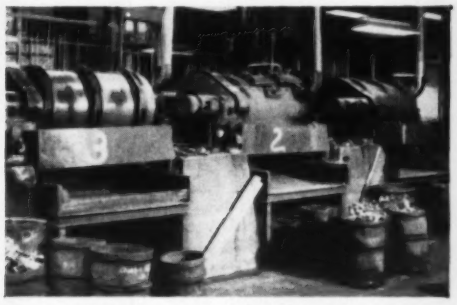
How is it possible for a lubrication program to produce cost reductions like this? Ask your Mobil Representative for the full details. Mobil Oil Company, 150 East 42nd Street, New York 17, New York.



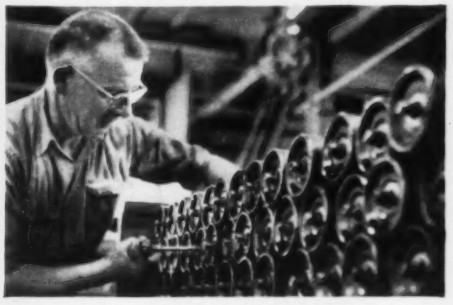
Leakage, make-up costs, frequent refillings and hazardous footing resulted from the use of a conventional lubricant in the automatic oilers on punch presses. At Mobil's suggestion, a change to a semi-fluid grease has saved $5,808 in 3 years . . . has also improved plant appearance and safety.



Periodic bearing failures on two carburizer furnaces were traced by Mobil to lubricant melt-out upon exposure to the 400° F. temperature above the furnaces. Substitution of a newly developed high temperature Mobil grease has reduced failures and cut application costs by $766 in 3 years.



Chain Belt employs several tumblers in its foundry to clean sand and burrs from castings. Heavy shock loads contributed to periodic failure of gear-head motor drives. A change to a new Mobil lubricant cut failures in half . . . saved $7,200 in labor and parts costs in a 3-year period.



Mobil also provides products and service for equipment manufactured by Chain Belt. Here, new Rex belt conveyor idlers are filled with a Mobil grease which protects against entrance of dirt and water during storage. Mobil rust preventive is also used to treat 4 million feet of chain annually.

Correct Lubrication

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9 sales and service offices conveniently located to serve you.

Contact the nearest office for the complete line of ELECTROMET ferroalloys and metals . . .
when, where, and how you need them . . .
from 6 plants and 26 warehouses strategically located for prompt shipment . . .
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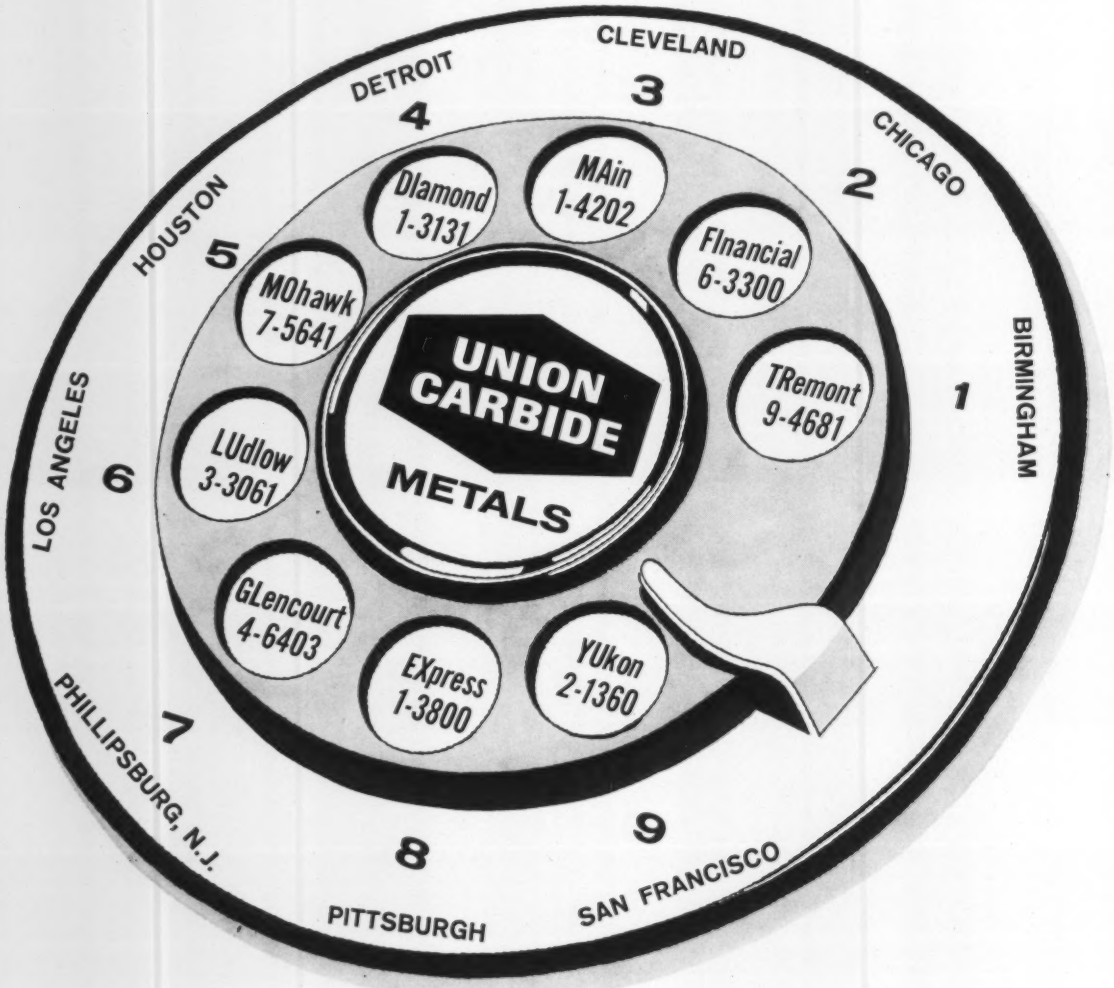

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TOOL AND DIE JOB SHOPS WILL GET A BOOST from a forthcoming make-or-buy study by a major university. The study indicates that savings from $137,250 to $292,500 are possible on a 30,000-hour set of mass production dies made in job shops compared to captive shop costs. Chief reason: Job shop overhead costs appear to be much less than in large captive shops.

THE UPSWING IN THE SCRAP INDUSTRY has led some dealers to go ahead with equipment expansion programs. One leading maker of scrap metal balers and shears, Harris Foundry & Machine Co., broke records in March with sales of $1.5 million.

FEDERAL SPENDING ON R&D will hit a new high of $9.4 billion in the coming fiscal year starting July 1. About 70 pct, or $6.6 billion of this amount, will be spent through contracts with private industry. The government now supports over 60 pct of all R&D in the nation.

INVENTORY REDUCTION CONTINUED during March, but at a lower rate than in February. This is the finding of the latest survey report of the National Assn. of Purchasing Agents. The record: 16 pct adding to stock; 30 pct reducing stock; the rest, no change.

TINPLATE PRODUCERS will push to have industry statistics include the number of base boxes shipped. This would give a measure of usage in terms of material area. Tonnage figures are misleading, say producers, because of the trend toward lighter weights. The new "thin tin" will start cutting into weight next year.

MACHINE TOOL ORDERS are making gains for at least one important producer, Warner & Swasey Co. Company president, W. K. Bailey, cites "substantial" month-to-month gains in February and March. Also, company shipments of construction equipment, he says, have already improved as "optimism among contractors and road-builders is being maintained."

"STEEL CAN NO LONGER RELY ON AUTOMATIC DEMAND--it's got to be sold." This was stated by Republic Steel's L. S. Hamaker on his recent appointment as marketing vice president. Rather than just offer steel for sale, he says, "we must study customer needs, especially smaller companies. We must advise on his marketing, product design, and merchandising requirements."

MORE THAN 100 P-A VENTURI GAS WASHERS NOW OPERATING IN THE STEEL INDUSTRY

Efficiency and economy proven for blast furnaces, open hearth furnaces, oxygen steel converters, electric furnaces and sintering plants.

Chemico venturi washers offer the following major advantages: low initial cost; virtually no maintenance; minimum space required; cleaning efficiencies approaching 100% can be obtained; adjustable controls maintain maximum efficiency at all rates of flow; recirculation minimizes water consumption; solids can be recovered in dry condition; and, power requirements on venturi washers are as low or lower than precipitators for open hearth furnaces and oxygen steel converters.
If you are considering the purchase of gas cleaning equipment, let Chemico show you how venturi washers are performing at steel plants from coast to coast.

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Foreign Automakers Push Sales, But Predict a U.S. Shakeout

Europe's automakers are trying to pull their cars out of a sales slump brought about by the recession and U. S. compacts.

But they admit that their share of the market will be smaller and some entries will lose out. By F. J. Starin

■ There were the usual new cars, new models and innovations at this year's International Auto Show in New York. But the biggest changes were in the attitudes and plans of the foreign auto company executives.

The consensus: No longer will the label "foreign" on a car guarantee its success in the U. S.

Just about all of the major imports are making some positive moves to improve U. S. sales. But these are headed in many directions.

Right Will Be Left—Whoever is right will determine which cars are left. Executives at the show say everyone can't be right, that some of the imports are headed for trouble in the U. S. market.

Here's how the situation developed:

Sales of foreign cars had moved up steadily, sometimes spectacularly, from $45 million in 1954 to $735 million in 1959. In 1960 it sagged by about 19 pct, to about $514 million.

But the adjustment hit very selectively.

Hardest hit, generally, have been the mass market, economy cars. Hillman was off. Renault sales dropped from 90,536 units in 1959 to 62,772 last year.

Some Did Better — Yet Volkswagen moved right along—selling 191,372 vehicles for a new peak over the 150,601 sold in 1959, the previous high.

Luxury cars did well. Rolls Royce and Bentley improved U. S. sales by about 35 pct. Citroen moved up about 15 pct. And Humber sales just about doubled.

Sports car sales held up generally. Alpine sales were up a shade under 10 pct. Jaguar just about held its own. And R. A. B. Learoyd, senior U. S. executive of British Motor Corp. Ltd., says its sportscar sales in the U. S.—Austin-Healey and MG—were off only 4 to 5 pct.

Stripped-Down—The long list of cars that bucked the trend can be misleading. Most are low-volume, high-priced cars. And, generally, they did not make up the difference

THE TIDE EBBS: Volkswagen was one of the few imports to boost U. S. sales in 1960. But the tide began to run out for many others.

SPORTSCAR ENTHUSIAST: Johannes Eerdmans, president of Jaguar Cars, Inc., answers questions about the new 150-mph XK-E model introduced at the International Auto Show held in New York last week.

on the other end of the line.

John T. Panks, managing director of Rootes Motors Inc., says sales of just about all its line of cars were up in 1960 — except the Hillman. Yet, total units shipped to the U. S. dropped from 31,000 in 1959 to 16,500 in 1960.

Mr. Panks thinks price might be the way to improve Hillman sales. The car has been stripped down. The price has been cut by several hundred dollars. He says sales are improving.

But, he concedes, "The family-type import priced in the same range as the (U. S.) compact cannot realistically be expected to recover the record sales it enjoyed a year or two ago."

Gallic Thinking—Renault has altered its thinking. The company's general sales manager, Hubert Bechet de Balan, concedes he will not be able to recover the 1959 level this year. He is now thinking in terms of percentage of the import market.

Renault's target this year is 15 pct. And they are hoping for 18 pct. Last year they sold 12.5 pct of all imports.

The big gun in this drive for a bigger piece of the market is a new car—the Gordini. Basically it is a luxury Dauphine. The company says the car was designed with the U. S. market specifically in mind. Despite the fact that Citroen sales held up last year while the economy cars had trouble, the company is coming out with a new economy car. The AMI-6 was not ready in time for the show. But Charles Buchet, Eastern Regional manager, expects this car eventually to account for 75 to 80 pct of his company's U. S. sales.

Service Sells VW—Service came in for a lot of attention from the importers. In fact Carl H. Hahn, general manager, Volkswagen of America, says the extensive service network of his company around the U. S. is a key reason its sales continued to boom. Mr. Hahn said further that the lack of service was one of the key factors that cut sales of the imports last year.

Mr. Hahn predicted that Volkswagen would sell about 200,000 units in the U. S. this year—about half the imported market. He said the company could sell about 250,000, but would not because this would strain the company's service facilities.

Sportscar Outlook—The British Motor Corp. will increase its share of the U. S. sportcars market from 52 pct to 62 pct within a year, predicts A. E. Birt, president of Hambro Automotive Corp., BMC importers.

One of the key reasons, says Mr. Learoyd, senior BMC U. S. executive, will be better service. "We've had some trouble with service," he concedes, "but that's just about over."

Fiat is expanding its service organization. Supplementing its two service schools, in Los Angeles and New York, Fiat will send four mobile instruction units on regular tours of the country.

The Backbone — Citroen's Mr. Buchet acknowledges that despite improved sales in 1960 he is concerned about service. He is now appointing service representatives, who are not dealers, in key cities of the country. These service dealers are trained and loaned tools by Citroen.

"The selling dealer is not always conscious of service," says Mr. Buchet. But Volkswagen's Mr. Hahn doesn't agree. "Service and spare parts are the backbone of our operation," he says. "You can't separate them from the dealers."

Fast Car Sells Fast — In the sportscar field, Jaguar has decided that performance will sell. The company developed a new 150 mph sportscar and held it for introduction at the Auto Show for maximum initial coverage. The company says it is the fastest production car ever offered for public sale.

Johannes Eerdmans, president of Jaguar Cars, Inc., U. S. subsidiary of Jaguar Cars Ltd., Coventry, England, reports that in the first three days of the show Jaguar transmitted orders for $30.6 million worth of cars to the factory in Coventry. The

big seller was the new XK-E.

The company has firm orders now for delivery of 5200 cars in 1961. In 1960 they sold 6050 cars.

Pre-Shrunk Market—If they disagree on share of the market, the executives of foreign car makers do agree, generally, on the size of the total market.

Vincent P. Grob, executive vice president of Renault Inc., predicts a continuing market for 300,000 to 500,000 imported cars annually.

VW's Mr. Hahn says the total this year will be at least 400,000. Rootes' Mr. Panks says, "Sales of imported automobiles in the U. S. will continue at near present levels and should total from 350,000 to 400,000 units in 1961."

Gold Flows Two Ways—There is a general uneasiness among foreign automakers about the possible U. S. plans to stem the flow of gold overseas by cutting down on imports.

Roland Peugeot, president of Les Fils de Peugeot, says any move to raise tariffs would be "short sighted and drastic." He points out that during the past 3 years his company spent $3.25 million for heavy equipment from the U. S.

Renault's Mr. Grob points out that in 1960 the U. S. bought $400 million of products from France, but sold to France $575 million. "Foreign trade is a two-way street in which the traffic should be increased in both directions," he says.

What They Buy Here — The British Automobile Manufacturers Assn. points out its members have about $34 million in parts in U. S. warehouses. They also note that: (1) The advertising and sales promotion budget in the U. S. is $9.5 million; and (2) 40 pct of British imports are sportscars, which do not really compete with U.S.-made cars.

Volkswagen says it bought over $50 million worth of machinery in the U. S. over the last three years. It buys $700,000 worth of steel and magnesium in the U. S. every month. And foreign trade provides more jobs in the U. S. than do the automobile, chemical, steel, and textile industries combined.

Is Steel Pickup On Target?

■ Is there any real momentum behind the current pickup in steel orders?

Yes, says R. F. Sentner, executive vice president, commercial, United States Steel Corp.

"Orders have been improving gradually," Mr. Sentner told The IRON AGE. "In terms of our estimates, I think we're about on target." He looks for a continuing advance to bring steel production somewhere near the 95 to 100 million tons predicted for 1961.

Reasons for Confidence — Mr. Sentner emphasizes the recovery has not yet progressed to the point where it can be considered an accomplished fact. This can only be determined by a continuing upward trend over a longer period of time. However, Mr. Sentner feels there are firm grounds for expecting a sustained advance. First of all, he says, steel consumption follows a clear-cut seasonal curve in a number of markets.

"We are going to get the benefit of demand that is influenced by seasonal factors," he states. Standard pipe, linepipe, merchant wire, tinplate, plates and structurals are cited as products that move up seasonally at this time of year. Tin plate is now seen heading for a year better than last.

Secondly, he believes increased consumption of steel has got to bring a quick increase in orders for steel. He recalls the past year as a period of unpredictable change for the steel industry. He thinks, now, the big source of uncertainty has been taken out of the picture.

"We won't be affected by decisions to liquidate inventory . . . that job's behind us."

Solid Ground—Finally, Mr. Sentner feels the rise in orders for steel is "a good solid one." There have been disappointments; automotive orders are on a "low, flat level." But this is not the kind of setback that baffles and shocks the mills.

"We know perfectly well why our auto orders are low," says Mr. Sentner. He is hopeful that a pickup in car sales will boost the steel needs some time in the spring.

It is a healthy sign, he feels, that general markets have moved up fast enough to offset auto losses.

SENTNER: On firm ground.

About Prices—With comfortable supply and tough competition indicated, what about steel prices?

"It is more than two and one-half years since the general level of steel prices was raised and during this period, we have had steadily increased costs—so the need for higher prices is clear," says Mr. Sentner. "But whether you can get them with domestic and foreign competition, along with competition from other materials, is something else."

PARTS SUPERMARKET: Some 700 parts for the GE-made jet engine were arranged supermarket fashion and 1400 businessmen saw new bidding possibilities.

PENCIL SHARPENED: Businessmen at the GE symposium saw dozens of jobs they could handle, but hadn't known what was wanted before the display.

For Small Plants: Tips on Bids

General Electric hosted 1400 small businessmen in Chicago.

They were invited to compete for shares in $300 million subcontracts covering components for company jet engines.
By K. W. Bennett

■ General Electric Co. lifted the lid on a $300 million defense sub-contract package at Chicago last week. At least 1400 Midwestern "small business" men were offered a crack at the contents.

The work, to be let by GE this year through its flight propulsion division, is for jet engine parts. The company displayed 700 of the 1200 major components in a jet engine. It also gave some clues to the dimensions of its buying program.

GE has 20 divisions, 110 departments. They'll spend $1 billion this year, scattering it among 45,000 suppliers.

Pandora's Box—As recently as Korea, sub-contracting was called a Pandora's box. When the lid lifted, many small companies complained, only a list of cranky parts emerged. These were sub-contracted because nobody could make a profit on them.

But comment at the GE parts display suggests this has changed; that sub-contract business is good business; and that GE's symposium bears repeating.

Bid on Parts—Most important: Visitors could see the parts that GE wants. Said W. H. Thompson, vice president and general manager of Bradley-Thompson Co., Inc., Detroit, "I've called on GE for years. This gives me a chance to bid on parts I didn't know they used. They've known me only as a precision machining source for magnesium gear cases." Mr. Thompson's company employs 50 men, is 11 years old. It will begin bidding on "quite a few parts" that it can make, but didn't know GE needed.

From Samuel Johnston, Jarecki Corp., Grand Rapids, Mich.: "We already do some defense work. I see quite a few casting machining jobs here. Our problem was knowing what GE wanted. We wanted to sell them. I've located at least a dozen jobs here we can handle. This is the equivalent of a year's business calls in one day."

70 Officers—To appreciate Mr. Johnston's problem: One GE department has over 70 purchasing officers, each with a specific area of buying responsibility. Jarecki Corp., employs 325, is a 48-year-old metalworking veteran.

W. O. Morgan, Illinois Machine Products Co., Rockford, Ill., said his 25-man, 10-year-old company, could handle at least 20-30 of the parts displayed, would probably go for business on 10.

Specialists Learn—Even defense specialists were educated. Sales Manager M. K. Garneau, McNally Bros. Machine & Gear Co., Inc., reports, "We're 100 pct on military work. I actually came down to discuss some existing bids, but I've spotted 50 parts we could bid on just as well. We're in precision machining, and have a line of precision gear heads." His company, at Grantsburg, Wis., employs 140, is 14 years old.

Capital goods slipped into the picture. J. D. Durant, Easco Products, Inc., Ann Arbor, Mich., came to look at sub-contract work. He decided a machine his company designed for a British plane builder might interest GE. Meantime, his 31-man company may bid on several machining jobs in refractory metals.

Price Worry — From Chicago, Edward Janus of Edmik Tool Co., offered another reason for sub-contract interest. His 22-man company has eight years of defense work experience, mainly with Nike missiles. "We can get the quality they want," said Mr. Janus. "We just worry about price, with this many potential bidders. We'll bid on some of these, and there are at least 40 or 50 jobs here we could handle."

Said Sales Engineer Vern Howe, Demmer Tool & Die Co., Lansing, Mich., "We're in defense, subcontracting for Pratt & Whitney on engine contracts. We're already in tube bending, machining, and stamping. I wish some more of our people could see this display. We do about 90 pct commercial and 10 pct defense work. The defense work is on a regular monthly delivery basis that offsets the seasonal declines from our auto accounts." His plant employs 125, is 11 years old.

Share Declines—Small business' share of military buying has declined for 6 years—from 25 pct of the total 1954 outlay, to 16 pct in 1960. This Administration notes small business received only $3.5 billion in 1960, wants it to get 10 pct more in 1961.

Westinghouse Acts

■ Pricing problems can't be avoided just by a statement of company problems. And pricing can't be isolated from profit and labor pressures.

These points were underlined last week at the stockholders meeting of Westinghouse Electric Corp. Recent antitrust violations did not result from the lack of a sound pricing policy, said M. W. Cresap, Jr., company president.

Communication Failure—"Westinghouse has had a long-standing official policy establishing the highest standards of legal and ethical conduct for the organization," he said.

Mr. Cresap reviewed steps taken by himself and the company to put this policy to work. He admitted they had not done the job.

" . . . I acknowledge the fact that unawareness of the antitrust violations indicates that the procedures were ineffective in communications and in review of compliance with corporate policy."

Corrective Program—To correct this situation, Westinghouse has started a highly organized program of education and review. Specific moves include:

1. An antitrust section has been set up within the company law department.

2. In 32 meetings attended by nearly 3000 management people, legal men have gone over the fine print of antitrust laws. Legal and ethical matters have been the main topics at four top-management sessions.

3. Penalties for misconduct have been clearly stated.

4. A new audit system requires a report from any employee going to a meeting attended by competitors.

5. The company has proposed that a new ethical code be drawn up for the whole electrical industry.

Regarding past violations, Mr. Cresap said Westinghouse would: (1) fight any claims it considered unjustified, and (2) offer voluntary payments if facts pointed to adjustment.

Personnel Decisions—He defended the decision not to fire individuals who had received jail terms. He emphasized he was not condoning their actions or offering future clemency. But he pointed to past good records, lack of personal gain and the harsh punishments already applied.

". . . It would have been an easy route," he said, "for me to have discharged these men out of hand and remained aloof from any sense of responsibility to them. This, in good conscience, I could not do."

The Moral Issue—In discussing violations, Mr. Cresap took up the question of possible conflict between the moral and economic pronouncements of management. He rejected the notion that convicted individuals had acted as "organization men," who could only meet company profit standards by shady means.

Westinghouse, he said, looks to cost reduction as the prime source of added profits. Price increases and volume increases must be treated as matters "which are beyond our control and which may not materialize."

Stockholder Reaction — This accounting drew approval from most stockholders. A resolution to oust company officers was voted down by a big margin. The proposed slate of directors went in without serious opposition.

However, stockholder comments made it clear management is boxed in on all sides in the cost-price squeeze. Westinghouse workers charged they were bearing the brunt of cost reduction efforts. Employees complained about subcontracting and layoffs. They said benefits were not enough.

On the other hand, one stockholder said employees were getting too large a share of the pie and owners too little.

Automated Press Widens Forging

Mechanical forging is moving from automotive crankshafts to other industrial lines.

High speed and cheaper dies make Eaton Co.'s new automated press economically feasible.
By T. M. Rohan

■ High speed automated forging with huge mechanical presses is branching out from its historic role in auto crankshafts.

The newest press in this class is 6000 tons capacity and 35 strokes per minute. It has just been installed at Eaton Manufacturing Co.'s Forge Division in Marion, O. It will compete for outside subcontract work, in addition to serving Eaton's other division which will account for about 60 pct of its time.

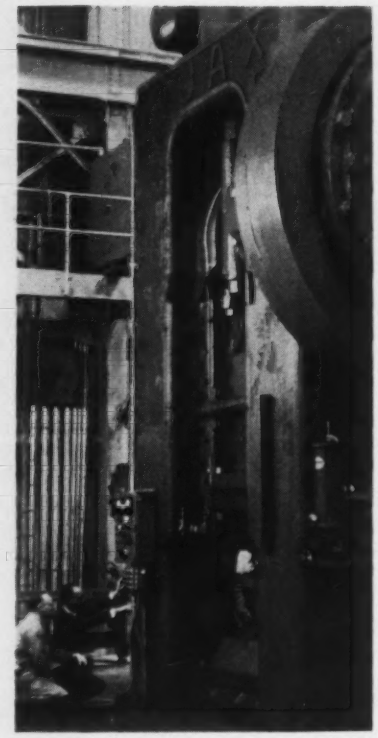
Number 10—The new $1 million press is the 10th of its size and type built since World War II by Ajax Manufacturing Co. of Cleveland. The others are mainly in high speed auto crankshaft work in the U. S. and abroad. One turns out 9000 crankshafts per day on a round-the-clock basis.

A few presses up to 8000 ton capacity are under construction by Ajax and the only other manufacturer in this class, National Machinery Co. of Tiffin, O. National has put in an 8000 ton unit in the Chicago area.

Money-Maker—The tremendous power and speed of the press make it a money-maker, even part-time.

"Because of the huge productive capacity of this system, it becomes economically feasible to operate at only 60 pct of capacity, even though it cost $1 million," says C. D. Barnes, sales manager.

"We feel we can bid competitively for subcontract work, even for runs of only about 100 pieces per month, for several reasons."



EATON PRESS: A money-maker.

Heavy Weight — The new press weighs about 450 tons and towers 24 ft from the floorline, 27 ft in all. Another 250 tons of reinforced concrete foundation was poured, raising total weight in place to about 700 tons.

It can operate continuously at a speed of 35 strokes per minute, but will do less initially because each billet must be moved through three stages by a manipulator. Stroke is 18 in.

"This new press will accomplish the work in three blows that smaller hammers need 25 to 45 to do," says Paul W. Olson, Eaton general manager at Marion.

Sharon Adds Two Slab Heat Furnaces

Sharon Steel Corp. is installing two new slab heating furnaces. The present 24-in. continuous hot strip building will be extended.

This is the third move this year in Sharon's $4.5 million modernization program. Earlier, a bright annealing unit was started. A vacuum stream droplet degassing plant is also being built.

A new 36-in. diam vertical edger will break scale and reduce the slab width so they will be uniform before entering the roughing line.

Military Uses "Simple" Modernization Formula

The Navy's machine specialist, R. W. Righter, says that the military tool modernization analysis is simple. It's applicable to both sophisticated numerical machines or a basic band saw. The reason:

"Military departments took a cue from progressive industries and armed military production facilities and contractors with a simplified version of the MAPI formula."

SBA Now Offering Lower Interest Rates

Lower interest rates for small businesses and development companies which build or modernize plants in depressed areas are now available from the Small Business Administration.

SBA Administrator John E. Horne says a special discount interest rate of 4 pct will be offered to small businesses to locate in 101 major industrial centers and 184 smaller areas of "substantial labor surplus." The old interest rate was about 5½ pct. Mr. Horne says:

"The lower interest rate should offer real incentives for small firms and development companies to move ahead with long-deferred construction, expansion, or conversion of facilities and purchase of needed equipment, machinery, supplies or for working capital."

INDUSTRIAL BRIEFS

Foil Buy—Republic Foil, Inc., Danbury, Conn., is acquiring Consolidated Bag & Foil Corp., Somerville, Mass. Consolidated will operate as a division of Republic, producer of high-quality aluminum foil.

Sealed Deal—Alloys Unlimited, Inc., Long Island, N. Y., has acquired Veritron West, of North Hollywood, Calif., manufacturer of glass-to-metal seals used in semiconductor devices.

Fire Brick Buy—North American Refractories Co., Cleveland, has acquired Ironton Fire Brick Co., Ironton, O., manufacturer of fire brick, plastics, mortars and related refractory products.

Major Interest — Latrobe Steel Co., Latrobe, Pa., has purchased a majority interest in Cast Masters, Inc., Racine, Wis., specialists in large precision castings for the pattern making and tooling fields.

Autolite Gets—Consolidated Smelting & Refining Co., Detroit, has been purchased by Electric Autolite Co., Toledo. Consolidated will continue to operate as a lead smelter.

Bowman Acquires — Bowman Products Co. has bought the Pyramid Nut & Bolt Corp., Newark, N. J. This is the first Bowman expansion in the fastener specialist field.

Soldering Sale — Former U. S. Senator William A. Purtell has purchased the Electric Soldering Iron Co. Inc., Deep River, Conn., manufacturer of electric soldering equipment, irons, pots and guns.

German Growth—Glidden International Div., the Glidden Co., has acquired a one-third interest in Herman Wulfing Wings—Lackfabrik, West German paint producer.

Forge Purchase—Ohio Forge & Machine Corp., Cleveland, has acquired all outstanding stock shares of Precision Cold Forged Products Co., Detroit. Precision is involved in cold forging, including extrusion and upsetting of ferrous and nonferrous materials.

Space Age Furnace Has Fluidized Bed

BUBBLING PROCESS: Swirling refractory particles suspended by jets of gas or air provide rapid temperature changes for parts being heat treated in this new fluidized bed furnace, developed by Boeing Airplane Co.

Triple "A" — The Austin Co., Cleveland, has formed two new engineering and construction firms in Australia and Argentina. They are called Austin-Anderson (Australia) Pty. Ltd., and Austin-Graziani S.A.

Bearing Gains—Meier Brass & Aluminum Co., Hazel Park, Mich., has opened a subsidiary, Meier Bearing Alloys, Inc., in Chicago. It will distribute high-quality and high-strength bearing materials.

Tool Trade—Fansteel Metallurgical Corp., Chicago, is acquiring Wesson Tool Co., Detroit, manufacturer of refractory metal cutting tools. Wesson has plants in Lexington, Ky., and Brighton and Ferndale, Mich.

Foundry Closing—The Arkansas Foundry Co., Little Rock, is discontinuing operation of its gray iron foundry in order to expand other divisions.

Name Change — Foundry Services, Inc., Cleveland, producer of compounds for treating molten metals, molds and dies, is now known as Foseco, Inc.

Indiana Lab — General Electric Co. is building a new "Lexan" polycarbonate product and process development laboratory at Mt. Vernon, Ind. It is part of the new polycarbonate plant of the chemical materials dept.

Chicago Move — Uddeholm Co. Inc. of America is building a new office and warehouse building in Elk Grove, Ill. The Swedish enterprise manufactures high grade Swedish steel.

Stainless Clad — Fairmont Aluminum Co., Fairmont, W. Va., says it has successfully joined, by molecular bending, aluminum sheet to stainless steel. It is now offering stainless clad aluminum to the metalworking industry.

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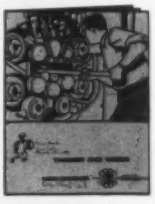

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What Employees Want to Know

Reaching and influencing employees has never been as important as it is now.

But there are many roadblocks managers face in getting the message across. Here are the reasons—and the remedies.

■ Never has it been more important for management to reach — and influence—employees.

Your success in getting over company views and aims can help in solving many present business problems. It can help employees understand the link between productivity, costs, prices, and sales. It can assist in getting greater efficiency.

Roadblocks Listed—But before you can "sell" your plans to employees, you must know what they want and why. There's more than a suspicion that many managers don't have a clear picture on this subject.

Recent studies point up some of the roadblocks. A survey of information demands among employees in six large companies, conducted by Opinion Research Corp., discovered untapped opportunities for selling ideas.

There is an opinion says ORC, that employees have to be tricked and humored into listening to what management has to say. On the contrary, information on a company's progress and prospects competes very successfully with chit-chat, jokes, and bowling news.

What They Want — But employees say they get plenty of recreation, social news, and personal items in company publications. They want more information on company plans for the future, policies, rules that affect jobs, and measures the company is taking to provide job security.

Another study, this by Armco Steel Corp., found these information needs among its employees. They wanted to hear more about: Opportunities for advancement, company prospects, safety, new equipment and how it helps, expansion and construction, and employee benefits.

The Opinion Research study also blasts several other misconceptions about employee communications. One belief: Management knows best what information employees should have. The fact: Even within company management there's often wide disagreement on which topics deserve top priority.

Difference in Views — In one company, for example, executives were asked to rate eighteen topics on the basis of priority. On eleven of the topics, the executives split in opposite camps.

Another belief: All employees have the same information needs. One bill of fare suits them all. Actually, this approach leads to watered-down communications. The audience is, in fact, very much segmented. Among the groups: Supervisors, those in other divisions, plants, and employees with a high initiative in public affairs.

Also it's believed management can exercise stop-go control over the information employees get. However, the company competes with many other sources that vie for employees' attention.

. . . And Ways to Reach Them

■ With all these roadblocks what can managers do to improve communications?

ORC suggests a six-point program:

Find out what the market wants.

Design a package that meets consumers' needs.

Capitalize on the information sources employees use. (Examples: Company publications, meetings, supervisors.)

If possible, enlist the help of the "idea retailers" within a company. (These are the employees with an unusual capacity to absorb and spread news.)

Suggest where they can go to get additional information, if wanted.

Why Change? — Such an approach is needed, ORC says, because of the changing make-up of the labor force. The educational level of workers is rising. There's more independent thinking.

Another source—Newcomb and Sammons, Inc., communications experts—suggests five points to keep in mind when communicating with employees: Tell them in advance. Tell them the truth. Tell them why. Tell them the bad with the good. Encourage them to speak up.

THE VITAL ISSUES
Facing Management

IRON AGE Interviews Robert F. Kennedy

Justice Department Policies

Few matters are more vital to metalworking companies planning to merge, buy or sell out than the attitude of the Justice Department toward such moves.

In this straightforward interview, Attorney General Kennedy presents his views on the enforcement of antimerger and antitrust laws.
By E. C. Beaudet, Managing Editor

■ **Q. Mr. Kennedy, the recent convictions involving the electrical manufacturing companies have focused attention on antitrust laws. Of course, prosecution of these cases originated under the previous Administration. Will the present Administration be less tough, or tougher on antitrust violations?**

A. We expect to be extremely interested in merger, as well as price-fixing, violations of antitrust laws. The Celler-Kefauver Antimerger Act will be enforced vigorously. I don't care to compare Administrations. I prefer to let the record speak for itself.

■ **Q. More recently, you asked the Federal Trade Commission to find out if companies previously convicted of antitrust violations were living up to court orders. You also expressed hope of a new era of Justice Dept.-FTC cooperation. Can this be regarded as a warning to business of your intention to pursue a vigorous antitrust policy?**

A. Yes. There are indications which lead us to believe that as many as 50 past defendents have not taken sufficient action to comply with court orders.

■ **Q. Does this include past convictions in the merger area?**

A. It does. We believe some companies may have retained stock interests in other companies which they were ordered to give up. We believe there is a need for a thorough reinvestigation of these and other past cases.

■ **Q. What is the Justice Department's objective in enforcing antimerger laws?**

A. Our purpose is to make sure that no enterprise has the chance to dominate or control an industry, or to start on a course that might lead in that direction. We plan to prevent monopoly and, where necessary, undo monopoly control. Our main objective is to protect the American system of free enterprise.

We look upon our antitrust enforcement policies as being pro-business—to protect the businessman as well as the consumer.

■ **Q. Do you view the steadily growing number of mergers as a threat to free enterprise?**

A. Mergers in themselves do not represent a danger to free enterprise. We aim to protect the small and middle businessmen who, I believe, are the backbone of our economy. In some cases, mergers can help competition rather than affect it adversely.

■ **Q. In what kind of cases?**

A. Well, for example, take the case of two weak companies within an industry. They may not be able to make it alone against stronger competitors. By joining together they may become stronger themselves and bring about more competition in the industry.

■ **Q. But what about the consumer? Might not mergers of large companies bring about more efficiency and, as a result, lower prices?**

A. Yes. Heavy concentration of economic power might be of temporary assistance to consumers. But there is no assurance that this would continue. If competition were not present, there's nothing to say that prices would not be raised arbitrarily in the future. This would then work against the consumer. Our job is to see that this is not allowed to happen.

■ **Q. Do you plan to put more emphasis on opposing mergers whose chief aim is diversification?**

A. Each case must be looked at individually. Any type of merger that lessens competition and tends to create monopolies will be scrutinized. In all aspects of antimerger enforcement, the Dept. of Justice will do what it is legally authorized to do.

■ **Q. There have been many mergers in the metalworking industry and, undoubtedly, more will take**

on Merger Laws

place. Briefly, how can companies best obtain clearances for proposed mergers?

A. By submitting, along with a clearance request to the Antitrust Division, as much pertinent information about the merger as possible. Also, by giving prompt and complete answers to questions the Antitrust Division might ask about the proposed merger.

■ **Q. How long might companies expect to wait for approval or disapproval of the Antitrust Division?**

A. This depends on how long it takes to secure all the information the Antitrust Division feels necessary to grant a clearance. After all the desired information is in, some expression of its view can be expected within two to four weeks. This, of course, depends on the work-load of the Division at the time.

■ **Q. It has been said that competitive information contained in pre-merger notifications has been leaked. Are greater safeguards needed?**

A. As you know, the Dept. of Justice through its investigations receives a good deal of confidential information of all kinds. Most of it concerns individuals. We have much less adverse information about companies. But as best as we can tell, no confidential information regarding individuals, mergers or anything else has been leaked from the Justice Department. Information like this occasionally does reach the public press from other sources.

Our attitude concerning the pre-merger notifications is that they are no one's business but the Justice Department's and the companies involved. This information will not be furnished to a company's competitor, or any one else. I would terminate the employment of any Justice Department employee who gave out confidential information.

■ **Q. What are some of the factors the Dept. of Justice considers in approving or disapproving pre-merger notifications?**

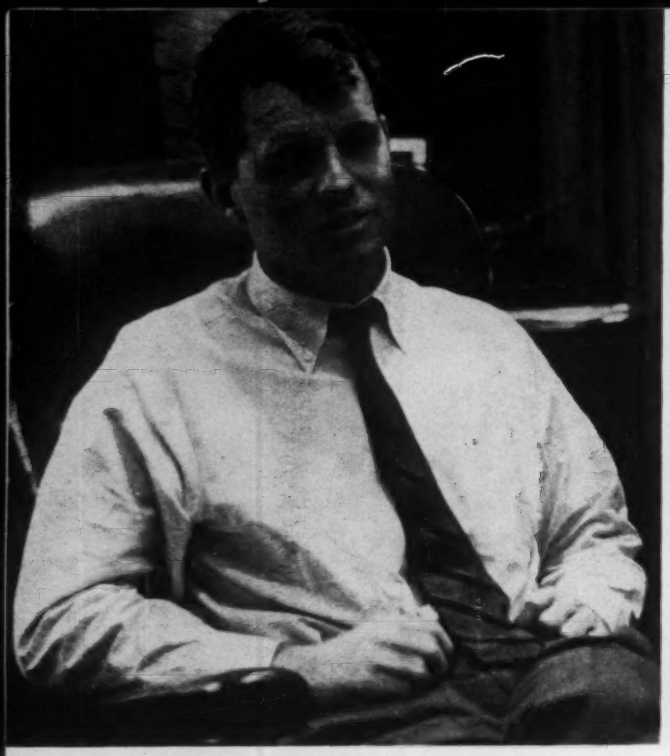
A. There can be no fixed set of standards which would bring automatic approval or disapproval from the Antitrust Division. We are guided exclusively by antitrust laws. Generally, the main legal points revolve around the relative market positions of merging com-

THE VITAL ISSUES

This is the second interview in a new series on the vital issues facing management.

In the first interview, Dr. George W. Taylor discussed the role of public members in labor disputes.

Look for more top-level interviews on critical management problems in future issues.



"We look upon our policies as pro-business."

"The Celler-Kefauver Act will be enforced vigorously."

panies and, as far as can be seen, the probable effect of a proposed merger upon competition.

■ **Q. What is your viewpoint on Sen. Kefauver's bill making pre-merger notifications, under certain conditions, a matter of law?**

A. In principle, I support it. However, I am not thoroughly familiar with all of its provisions.

■ **Q. Suppose one company acquires another without first clearing the merger with the Dept. of Justice? Is there a time period after which the company can feel the acquisition won't be challenged?**

A. Regardless of the time elapsed, there is no statute of limitations which bars the Justice Department from challenging a merger. Mergers will be challenged whenever we believe such action is in the public interest in line with the principles of the Celler-Kefauver Act.

■ **Q. If a merger is found to be illegal, are the selling companies and their stockholders subject to any penalty?**

A. Not ordinarily. The remedy for violation of the Celler-Kefauver Act is divestiture of stock and assets acquired illegally. The DuPont-General Motors case now before the U.S. Supreme Court may bring forth some principles which point the way to potential remedies in these situations.

■ **Q. How do you view the formation by competing companies of a new corporation to engage in activities related to those of the competitors?**

A. Again, this depends on the particular case. I would like to point out, however, that by forming a common subsidiary, competing companies cannot do indirectly what they are forbidden by law to do directly. We are likely to inquire into such matters.

Certain special considerations, though, are involved with respect to foreign commerce. For example, under the Webb-Pomerene Act, competing companies can form an export association as long as they abide by the provisions of the act.

■ **Q. Are American corporations bound by U.S. antitrust laws when they buy or merge with foreign companies?**

A. Generally speaking, American corporations are bound by U.S. antitrust laws regardless of the nationality of the companies they buy or merge with.

But the question is far more complex than this. Foreign mergers differ from domestic mergers because of their possible effect on the national welfare. Foreign trade and international policies must come first. Each case, however, is decided on its own merits.

■ **Q. In the above two questions, does it make any difference if underdeveloped nations are involved?**

A. That would be one of the factors that would have to be taken into consideration.

■ **Q. We've heard a lot about the "failing company doctrine" which is said to permit mergers which other-**

"Foreign trade policies must come first."

wise might violate antitrust laws. Will you please explain what this means?

A. The "failing company doctrine" is a popular term for the principle which holds that a company, because of financial losses, might go out of business if it did not merge. In such a case the merger would not appear to have anti-competitive effects.

Keep in mind, however, that, just because a company is or has been losing money, this does not necessarily mean that it is a "failing company," unless it is in bankruptcy or able to prove it is on the verge of it. Remember, also, that even though a company is a "failing" one, if the merger has anti-competitive effects, it cannot take place legally if another purchaser is available.

■ **Q. Does the Dept. of Justice contemplate future antitrust actions against labor unions?**

A. Where unions and management join together to kill competition or fix prices, we will prosecute. Action would be taken against both. We are looking into several cases of this kind right now.

■ **Q. Presently, could action be taken against unions alone?**

A. No. Under the law and court decisions there has to be a conspiracy between the two.

■ **Q. Do you believe there is a need for legislation to curb monopolistic practices of labor unions and safeguard rights of union members?**

A. Not at this time. The Landrum-Griffin bill was passed only in 1959. There should be more time to determine how effective its provisions will be.

■ **Q. What about trade association memberships? Need companies be concerned about the risk of possible antitrust prosecution because of membership?**

A. There's nothing wrong with companies within an industry getting together to promote the best interests of the industry and themselves. If they don't take part in illegal activities, there's nothing to be concerned about. If they meet to fix prices, or otherwise violate antitrust laws, that is another matter.

■ **Q. But what about those companies which are unaware of or don't join in illegal activities within a trade association?**

A. I doubt if there are many situations like this. Regardless, it is important that each company makes sure it knows what it is getting into.

■ **Q. Mr. Kennedy, earlier, you said you looked upon antitrust enforcement policies as being pro-business. How might business help in carrying out these policies?**

A. If business realizes that the Justice Department truly wants to be of assistance, there are several things it can do.

First of all, it must recognize that nothing hurts business competitors more than other competitors who get together to thwart competition, fix prices, or engage in other illegal activities.

Secondly, business should be more willing to assist the Justice Department in carrying out antitrust enforcement policies. We are here to help, but we have had little help from business.

When I was a member of the Senate subcommittee investigating rackets in the labor-management field, I was amazed at the unwillingness of business to help us and come forward with information. Businessmen seem willing to complain about unjust union practices but don't seem willing to do anything about them. Nor have I noticed that business groups, to any great degree, have expressed disapproval publicly of the recent price-fixing scandals.

This may come from the idea of minding one's own business. All too often, business' attitude is to let well enough alone if profits are good. However, business should make the government aware of those instances where mergers are stifling an industry, where there is reason to suspect price fixing, or where management is joining with unions to freeze out competition.

I feel that business has a responsibility to its community, to its state and to its country. It should be willing to help its government. If it's not going to help it, then business should stop complaining about it.

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New Uses for Porcelain Enamel?

Auto Markets Sighted in Manifolds, Body Parts

Mufflers remain the automotive market key for manufacturers of porcelain enamel.

But new areas are being tested. Ceramic coated manifolds and body parts may be the next step.

By A. E. Fleming

■ Corroded mufflers and rusty rocker panels plague the purse of car owners and peace of mind of auto makers. They are being studied closely by the porcelain enamel industry.

Suppliers of porcelain enamel already have a foothold in the muffler market. American Motors Corp. uses ceramic coated mufflers on all Ramblers.

The porcelain industry would like to push a bit deeper, however, moving into such areas as smog elimination devices, manifolds, and even body parts.

Sales Impact—But mufflers are the key. The sales impact of ceramic mufflers has reached the replacement market where 200,000 may be sold in 1961.

Many muffler manufacturers are far from enthusiastic about products which would eat into their replacement business. Auto sources estimate corrosion replacement of 25 million mufflers and tailpipes a year at $500 million.

New Guarantees — Automakers have recently extended new car guarantee periods. So they should be more anxious to have a muffler that will last three or four years. This is the length of time many new car buyers keep a car.

But cost is important. And engineers are hammering away at this.

COATED MUFFLER: Roger Arnold, ceramics engineer for Briggs Manufacturing Co., checks thickness of porcelain coating on a sectioned muffler.

Although Rambler is solidly in ceramic muffler activity, other carmakers may not join as easily. However, Ford is thinking of testing ceramic mufflers on 4000-5000 cars of a particular model for one year.

Cost Drawback—Chrysler engineers seem interested, but are being checked by costs. Incidentally, the current standard dual exhaust system on Chryslers and Imperials will be yanked from 1962 models and replaced with a single system.

Another area intrigues porcelain enamelists. Smog elimination devices of the after burner variety use fire to absorb hydrocarbons and carbon monoxide in exhaust gases. Clay ceramics might be used in this fire type. This could mean business for porcelain enamel.

Manifold Tests—Tests also are taking place on both intake and exhaust manifolds, coated with porcelain enamel inside and out. The point is to see if a reduction in turbulence would boost horsepower enough to justify expense. Tests are being made on high performance engines, where every bit of power is important. The results should be arriving soon.

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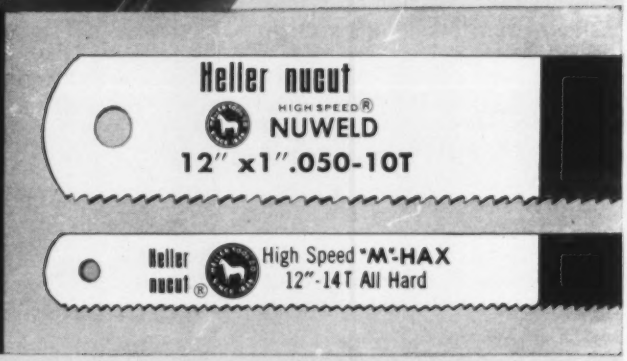

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Industrial Boom Hits Arizona

Climate, Labor Market Lure Nation's Top Companies

Aerospace and electronics are pacing Arizona's industrial boom.

A study shows more diversified companies will be settling in the state in the next decade, attracted by the climate and big labor pool.
By R. R. Kay

■ Going to the Farwest? Take a look at Arizona. Its economic picture has a rosy glow. And a new ten-year forecast points to an even brighter future.

Manufacturing is one of the keys to the Grand Canyon State's success. Much of the boom so far is from the aerospace and electronics industries.

Top Names — Well-known national names are there. Here are a few: General Electric Computer Dept., AiResearch Manufacturing Co. of Arizona, Controls Co. of America, Goodyear Aircraft, Hughes Aircraft, Motorola, Sperry, and Yuba Consolidated Industries.

Reynolds Metals runs the world's largest aluminum extrusion plant in Phoenix.

Many companies are expanding their plants. Others have plans. And the state is putting on a drive to attract new manufacturers.

Mines Lead — Mining has long been a vital segment of Arizona's economy. The state supplies about half of the nation's copper output. It also ranks high in gold, silver, lead, zinc, and uranium production.

If you want to know what's going on, there is a well-documented study by Arizona State University's Bureau of Business Services. It will intrigue market, sales, and advertising planners.

For "Arizona's Dynamic Future —An Economic Portrait," write to: Bernard M. Mergen, director, Arizona Development Board, 1521 West Jefferson St., Phoenix.

Behind Growth—Here are some highlights of the study.

Three big reasons back up the rosy ten-year forecast: 1—Explosive population growth; 2—Desirable climate; 3—An aggressive program to get more industry.

During the past 10 years, 100 new residents a day have crossed the borders into Arizona. And they're still flowing in at the same rate.

On top of that, Arizona has a young population and its own big baby boom. Population in 1940 was 750,000. By 1970, it should hit two million.

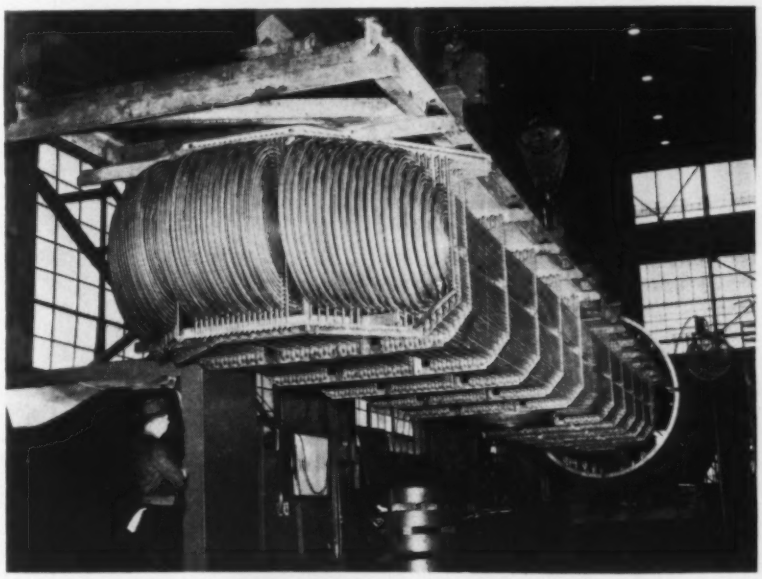
Good Weather—Climate is a big attraction—for tourists, health seekers, and industry. For electronics, it's mighty important. Hot, dry weather makes for easier production of sensitive electronics products.

The growing labor market, plus vacation-type climate, are attracting industry. Manufacturing employment just 10 years ago was 15,700. Today it is 46,000.

By 1970, it's forecast that 110,000 persons will have manufacturing jobs.

Ten-year plans promise plenty of electrical power, natural gas, water, and financing. Arizona is not yet a 50-year-old state. But in a short time it's made a prominent place for itself in the nation's economy.

Huge Generator for Hanford Is One of Ten



MORE POWER: Combustion Engineering, Inc., Chattanooga, Tenn., has shipped the first of 10 steam generators to the AEC Hanford Works, at Richland, Wash. It contains about 20 miles of stainless steel tubing.

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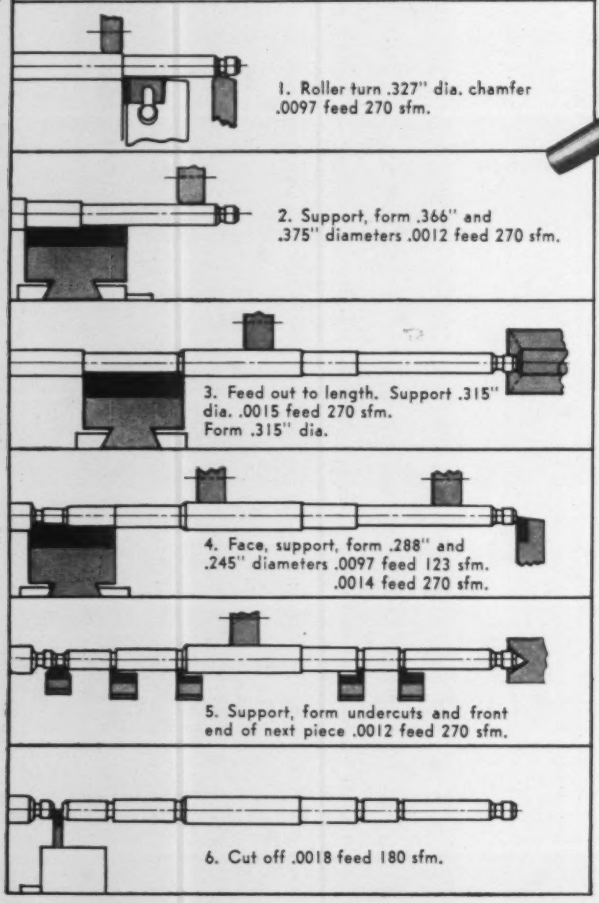
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4. Face, support, form .288" and .245" diameters .0097 feed 123 sfm. .0014 feed 270 sfm.
5. Support, form undercuts and front end of next piece .0012 feed 270 sfm.
6. Cut off .0018 feed 180 sfm.

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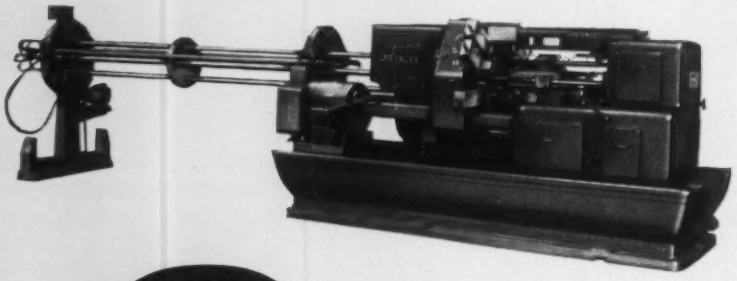
2. Eliminate scoring of stock . . .
3. Reduce downtime during set-up . . .
4. Provide extra length feed-out . . .

The part is a 6-7/8" long armature shaft used in the "Electrolux" vacuum cleaner. It demonstrates how effectively Greenlee Air-Feed Automatics and carbide tooling can team-up to increase production and reduce costs. The shaft is machined from 13/32" S.A.E. 1137 steel at a gross production rate of 620 pieces per hour. Recommended cutting speed for high speed tooling is 120 sfm. The rate was boosted to 270 sfm with carbide-tipped tooling. Sequence of operations is shown at the left.

Note how the stock is partially fed out on the index and to its full length in the third position. This provides for the most effective tooling arrangement. Greenlee Air-Feed Automatics permit greater job versatility and assure added profits. See your Greenlee representative or send us a print of your high-cost problem-part.



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Burrs Spur Finishing Progress

New Machine Solves Problems in Production Holes

Hardened steels and alloys used in missiles and rockets have caused surface finish problems.

But finishing technology is advancing rapidly. Now these metals can be handled almost as easily as softer materials.
By R. H. Eshelman

■ Metal finishing technology today is rapidly being rocketed into the space age. It must, to keep pace with materials and engineering advances. The new know-how is shown in production hole finishing.

No matter how carefully finish-machining operations are done in metals, there are usually burrs surrounding holes. This often cannot be tolerated.

Frequently, surface finishes are not what the blueprint calls for. These problems grow even more pronounced when working heat-treated steels of 300 Bhn and above.

Finish Hardened Metals — Hole-finishing tools can be used as successfully on hardened steels and alloys as they have been on softer metals. But they must be used differently.

One such tool, developed by Cogsdill Tool Products, Inc., Detroit, ingeniously removes burrs from both top and bottom surfaces of a hole in a single in-and-out operation.

Production engineers, however, go to special high-speed steel cutting blades when they are to be used for finishing hard steel. They have been used effectively on parts having hardnesses up to 375 Bhn. They work equally well on job-lot setups or mechanized lines.

Improved Wear — Bearingizing tools, used to refine surface finishes, improve wear characteristics. They reduce friction and improve hardness and strength characteristics of holes, surfaces of round and flat surfaces by roll-peening action. They are effective on steels with a hardness up to about 555 Bhn.

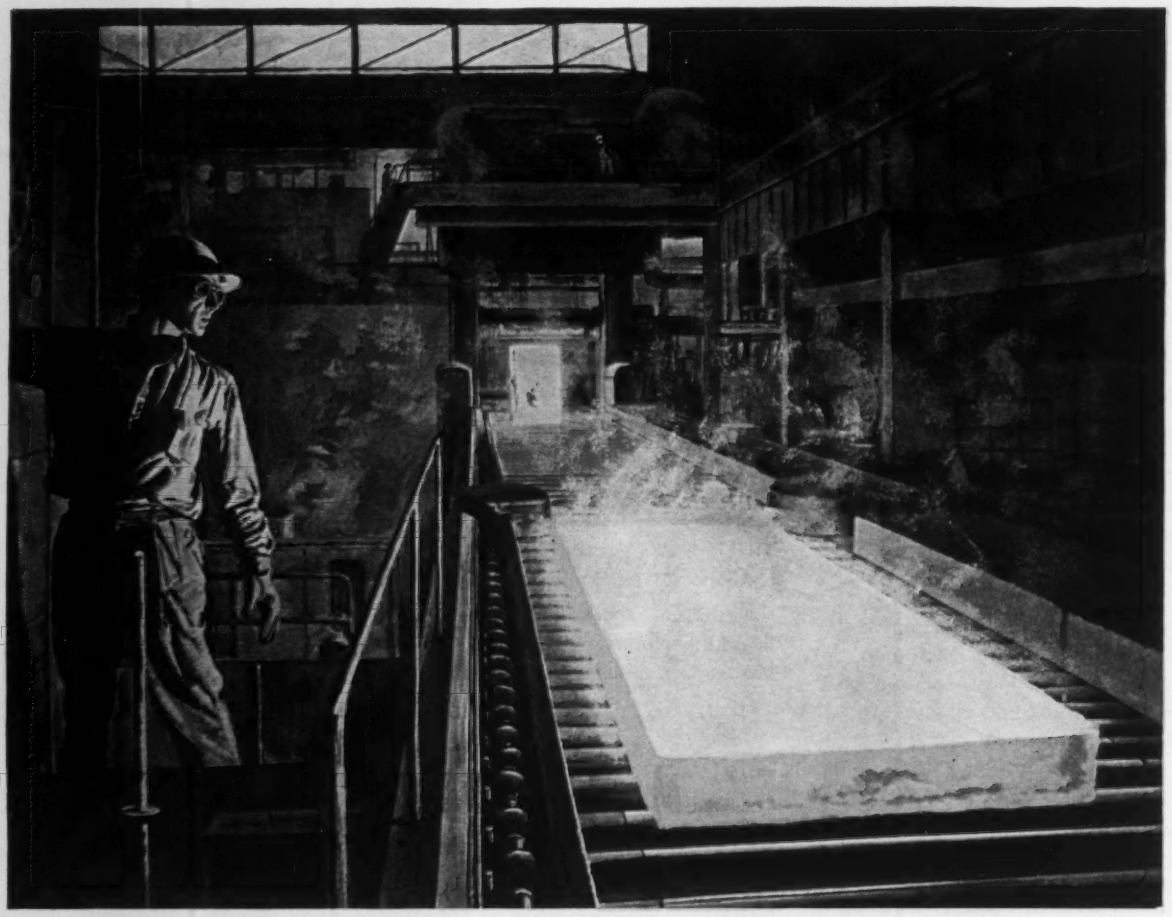
However, application engineers note, the amount of hole enlargement and the surface improvement that results lessens as hardness goes up. At 555 Bhn, finish is improved by about 5 to 10 microinches (rms) and holes are opened no more than 0.0002 inch.

Roller Action — Such types of tools are used for finishing the surfaces of holes. But constant pressure, rather than impact, is the key feature associated with action of the rollers.

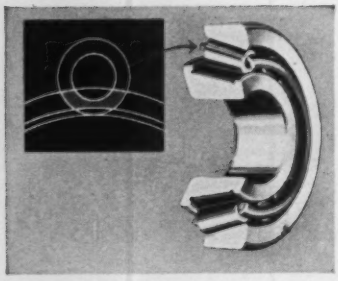
These tools can be used in steels with hardnesses up to 363 Bhn.

Machining Turbine Runner Is Big Job

ROUGH TURNED: A 95-ton Hydraulic turbine runner, one of seven for the Oahe Reservoir Project in South Dakota, is being rough machined at Allis-Chalmers, West Allis, Wis., Works on a 30-ft mill



Bearings "keep cool" under hot steel!



HIGHER FLANGE IMPROVES ROLLER ALIGNMENT

As shown by the gray area above, the higher flange provides a large two-zone contact area for the roller heads. This greatly reduces wear—practically eliminates "end play". Larger oil groove provides positive lubrication.

Watch it! Coming down the line—another half-formed slab of red-hot steel! And with it comes a supreme test of bearing excellence. Bower Bearings are equal to it—helping to keep this mill operating smoothly and continually despite heavy loads and extreme temperature. Whatever the job, there's a Bower Bearing engineered to perform just as dependably when the going is toughest. Rigid quality controls and basic bearing design refinements like those shown at the left have reduced Bower Bearing failure to a practical minimum. If your product uses bearings, specify Bower! There's a complete line of tapered, straight or journal roller bearings for every field of transportation and industry.

BOWER ROLLER BEARING DIVISION
FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS

L. S. Hamaker, named vice president, marketing, Republic Steel Corp.

Miller and Co.—**C. F. Joseph,** formerly technical director, Central Foundry Div., General Motors Corp., named consultant.

Continental-Emsco Co. — **R. C. Rieder,** named vice president, manufacturing and engineering.

Morgan Engineering Co.—**A. F. Morris, Jr.,** appointed vice president, sales; **R. P. Williamson,** appointed vice president, international sales.

Eaton Mfg. Co.—**F. C. Roberts,** elected assistant controller.

Beckman Instruments, Inc.—**E. P. Tagge,** named asst. to the president.

Champion Rivet Co. — **E. J. Markert,** appointed vice president, manufacturing; **W. F. Dempsey,** appointed forging div. manager; **D. J. Schaefer,** appointed welding div. manager.

Cohu Electronics, Inc.—**A. C. DeNapoli,** appointed vice president, engineering and manufacturing, Massa Div.

Elwell-Parker Electric Co.—**S. K. Towson, Jr.,** elected president and chief executive officer; **W. A. Meddick,** named chairman of the board.

Hubbard and Company—**Thomas Hollingsworth,** elected vice president, sales.

Hanna Mining Co.—**E. S. Mollard,** named vice president, mining operations, and general manager, mines, M. A. Hanna Co.

Bendix Corp.—**Dr. R. D. O'Neal,** elected vice president, engineering; **R. H. Isaacs,** elected vice president, government relations.

Goodyear Tire & Rubber Co.—**C. J. Thomas,** named manager, wheel and brake engineering and mfg., Goodyear Aircraft Corp.

E. C. Jeter, appointed general manufacturing manager, Engine and Foundry Div., Ford Motor Co.

Sprague Electric Co.—**F. R. Lack,** named senior vice president, research.

Stalwart Rubber Co.—**A. W. MacAlonan,** elected president.

Tennessee Products and Chemical Corp.—**A. L. Ascik,** elected vice president.

Transue & Williams Steel Forging Corp.—**W. H. Murphy,** elected vice president, mfg., forging div.; **E. W. Glauser,** elected vice president, mfg., stamping div.

Veeder-Root Inc.—**J. D. Warfield,** named vice president, sales.

Willys Motors, Inc. — **W. M. Sales,** elected controller.

(Continued on P. 80)

D. J. Bastian, appointed general manufacturing manager, Automotive Assembly Div., Ford Motor Co.

E. H. Kolb, appointed vice president and general manager, Chapman Valve Mfg. Co.

W. C. French, Jr., appointed general manager, sales, Tube Div., United States Steel Corp.

(Continued from P. 79)

Potts-Farrington Co. — **J. B. Owen,** appointed vice president.

Vitro Corp. of America—**Dr. D. M. Allison, Jr.,** named president, Vitro Electronics.

Plume & Atwood Mfg. Co. — **G. N. Stuart,** appointed plant manager.

A. P. Green Fire Brick Co. — **Dr. J. A. Crookston**, appointed director of research.

Armco Div., Armco Steel Corp. — **J. G. Purvis,** named manager, personnel.

Bell Intercontinental Corp.—**R. D. Howse,** elected vice president, marketing.

CompuDyne Corp. — **J. H. Clarke,** elected vice president, Systems Div.

American Machine and Metals, Inc.—**F. R. Gruner,** appointed director of engineering, operations, East Moline, Ill., plant.

Fox Steel Pipe Corp. — **R. E. Johnston, Jr.,** elected vice president, sales.

Harvill Corp.—**H. R. Alexander,** appointed vice president.

R. G. Rhett, appointed general purchasing agent, Kennecott Copper Corp.

R. B. Hewett, appointed manager, facility surveys, Crucible Steel Co. of America.

Union Steel Corp.—**Parker Van Dien,** appointed manager, sales, Strip Div.

National Research Corp.—**Dr. J. H. Gardner,** elected vice president.

Aluminum Co. of America — **R. M. Smith,** appointed development manager, consumer durable goods; **J. M. Smith,** appointed development manager, transportation.

Westinghouse Electric Corp. — **C. W. Mills,** appointed manager, market development, apparatus sales organization.

Adamas Carbide Corp. — **W. T. Nystrom,** appointed field sales manager, Kenilworth, N. J.

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Our inspection projector magnifies cutting edges to eliminate the minute angular deflection that could cause you costly production losses . . . just one of many inspections that account for Circle R quality.

CIRCLE R saws, slitters and combination center drills must submit to constant exhaustive inspection to work their way to you. They've got to prove they can ensure you correct cutting angles, long service, and minimal downtime.

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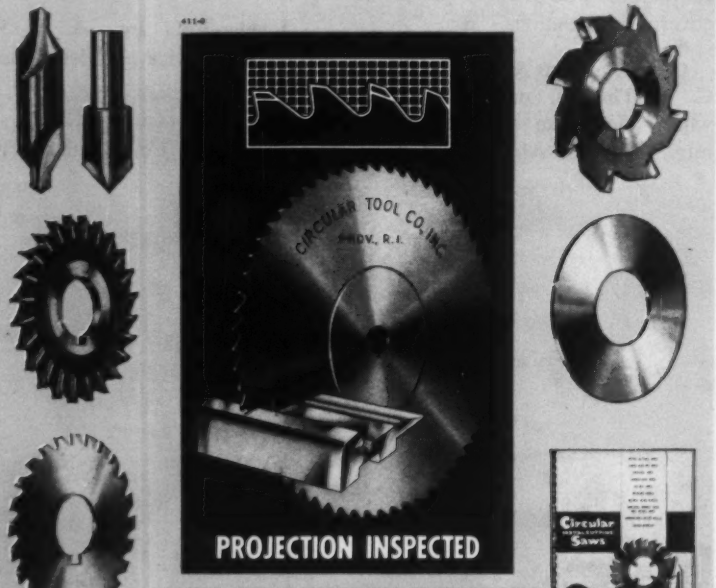

SAWS FOR ALUMINUM EXTRUSIONS

Send for Catalog P Showing More Than 1200 Items

YOU ARBITRATE IT!

Bad Actor

▪ When Philip G. filed his employment application with a coppertube manufacturing company, he answered "no" to: "Have you ever been arrested for other than minor traffic violations?" He also denied having served in the armed forces.

He got the job and almost immediately became a disciplinary problem. Within a few months, he was given a week's layoff for participating in a dice game, and he was reprimanded numerous times. During his seventeenth month on the job, management noticed serious goings-on in Phil's department. The company launched a full-scale investigation of the three suspected ringleaders. Phil was one of them.

The Result?—The check revealed a "bad conduct" Army discharge and three suspended sentences for felonies in Phil's past. He was promptly discharged. "You were warned on the application that a willful misstatement would lead to discharge," the personnel manager reminded him. "We've got you dead to rights now and you're through."

But the union filed a grievance. "You had plenty of time to investigate Phil during the first year," the international representative said. "There ought to be a statute of limitations on investigating old application forms."

Eventually the case went to an arbitrator selected from the files of the American Arbitration Assn. How would you rule?

The Arbitrator Ruled:

He said that although the contract didn't contain a time limit on investigation of an employee's record, this particular discharge was not justified. His reason? The company had had sufficient cause, considering Phil's misconduct, to investigate him earlier. Phil was reinstated; but in view of his record, no back pay was awarded.

From the files of

The American Arbitration Association

"You Arbitrate It!" appears in the second issue of The IRON AGE each month. Look for it in the April 13 issue.

CAUTION: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

POSITIVE CORROSION CONTROL FOR STRUCTURAL STEEL

at 1/2 the average COST

in 1/2 the average TIME...

GACOTE NA-62

MAINTENANCE COATING

Protect your structural steel, tanks, piping, towers against weathering, moisture, chemical fumes and splash with GACOTE NA-62 Maintenance Coating. Provides positive corrosion control—cuts application cost and time in half.

- Minimum Surface Preparation
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WILMINGTON 99, DELAWARE
PROTECTIVE COATINGS AND LININGS: GACOTE, NEOPRENE, HYPALON, URETHANE, EPOXY, VINYL, NATURAL RUBBER, PENTON

DODGE HAS MORE PROVED BEARINGS THAN YOU HAVE BEARING PROBLEMS!

It pays to buy from a line of stock bearings—bearings that have been proved in thousands of installations similar to yours. You benefit by getting known dependability; and you get the important savings of high quality at production price.

PIN-POINT SELECTIVITY

Dodge has supplied mounted bearings to industry for over three-quarters of a century. Dodge bearings have always kept pace with improved production practices. Each new condition of service has been met by Dodge as it has arisen, with the result that the Dodge line contains mounted bearings to meet almost every service requirement with pinpoint accuracy.

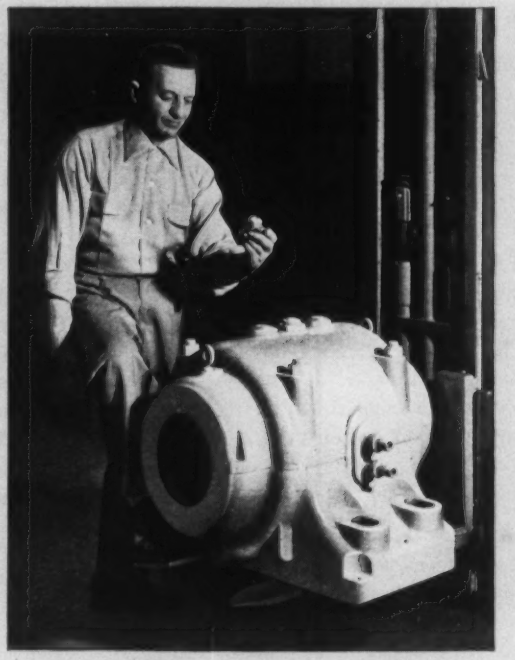
High load, high speed, excessive dust, moisture, corrosion, high or low temperatures, continuous operation—you name it!—such conditions and their combinations are met every day with Dodge bearings.

BROAD LINE—WIDELY DISTRIBUTED

In the great variety of mounted bearings developed by Dodge, you will most likely find the precise unit to fit your requirements ideally—without paying for features you do not need. And if your requirements call for several types of bearings, there is an advantage in having them of common design, such as Dodge offers.

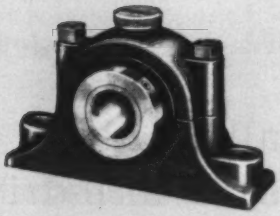
The Dodge line is probably broader than any other line of mounted bearings in America. And of special importance to machinery manufacturers, it is the most widely distributed line. There is always a Dodge bearing of the right type and size near at hand.

You can check this with your local Dodge Distributor. Ask him—or write us for the Dodge Bearing Bulletin.

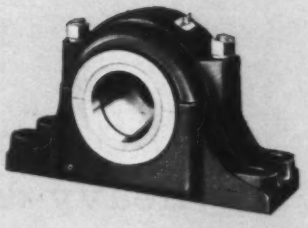


In addition to tapered roller, spherical roller and ball bearings, Dodge builds many types of sleeve bearings. Here is the "large and small" of the sleeve type bearings carried in stock—ranging from an 8-in. Sleevoil weighing over 1200 lbs. to a ½-in. solid journal bearing weighing 9 ounces.

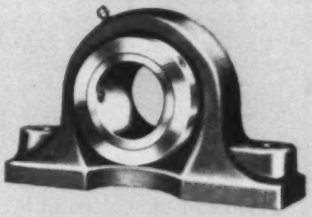
DODGE MANUFACTURING CORPORATION, 800 Union Street, Mishawaka, Indiana



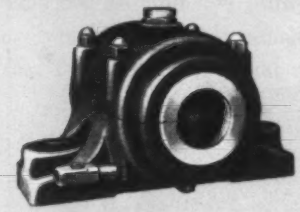
DODGE PILLOW BLOCKS WITH TIMKEN TAPERED ROLLER BEARINGS



DODGE SPHER-ALIGN PILLOW BLOCKS WITH SPHERICAL ROLLER BEARINGS

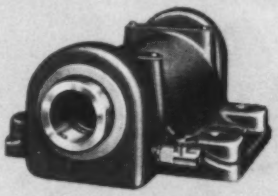


DODGE BALL BEARING PILLOW BLOCKS

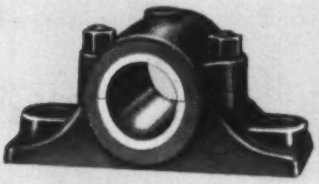


DODGE SLEEVOIL PILLOW BLOCKS

DODGE BRONZOIL PILLOW BLOCKS

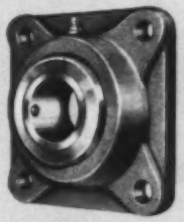


DODGE BRONZE BUSHED PILLOW BLOCKS



DODGE JOURNAL BEARINGS SOLID AND SPLIT

DODGE HEAVY RIGID PILLOW BLOCKS



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● **Dodge Spher-Align with Spherical Roller Bearings.** Rugged heavy duty, compact, inherently self-aligning. Exclusive Micro-Mount simplifies installation.

● **Dodge Ball Bearing Pillow Blocks.** Deep groove ball bearings with long inner races—high capacity. SL, SC and SCM models for light, normal and medium service respectively.

● **Dodge Sleevoil Pillow Blocks.** Ultra quality . . . extra long life . . . accessibility . . . *quiet*. Plain or water-cooled.

● **Dodge Bronzoil Pillow Blocks.** Efficient, low cost pillow blocks with self-oiling, capillary bronze bushings. Self-aligning. Large oil reservoirs.

● **Dodge Bronze Bushed Pillow Blocks.** Quiet fan and blower pillow blocks with two bronze bushings of high lead content mounted in one cast iron housing.

● **Dodge Journal Bearings — Solid and Split.** True running, dependable. Babbitted bearings with precision machined bores and faces. Finished bases.

● **Dodge Heavy Rigid Pillow Blocks.** Rugged, carefully bored, babbitted pillow blocks for many applications requiring grease lubrication. Finished bases and ends.

● **Bearing Units.** A wide variety—spherical seat, cartridge, flange, hanger, screw conveyor hanger, take-up. Ball, Roller and Sleeve types.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

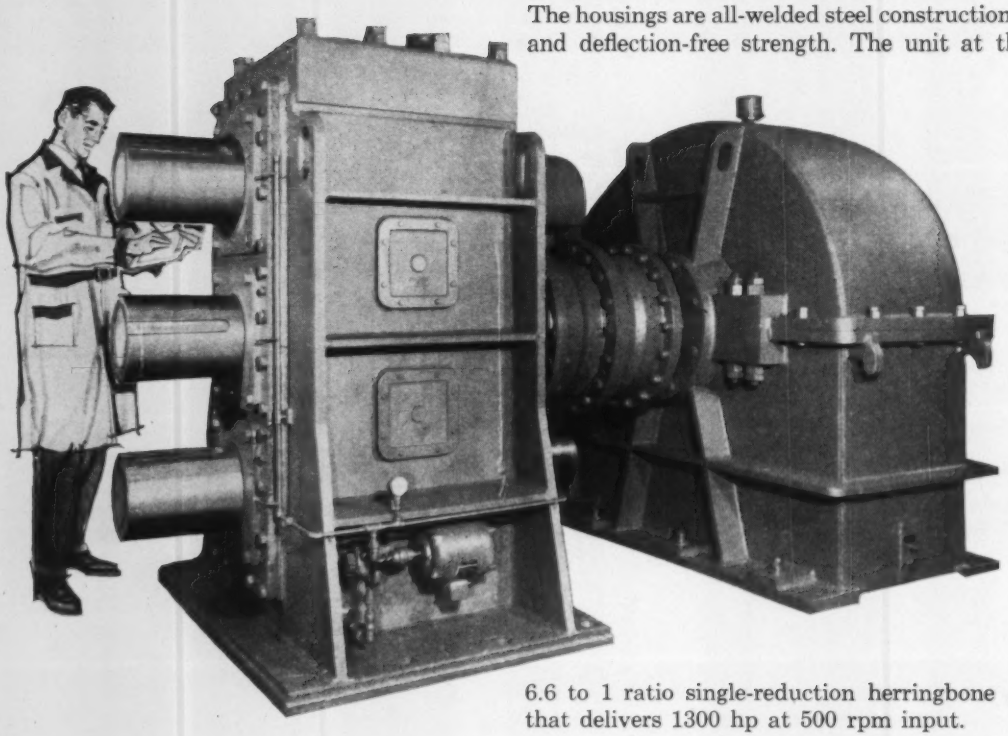
DODGE

of Mishawaka, Ind.

D. O. James all-welded heavy-duty steel mill drives

This two-high rolling mill drive is typical of D. O. James' capabilities in heavy-duty reducers and gearing.

The housings are all-welded steel construction for economy and deflection-free strength. The unit at the right is a



6.6 to 1 ratio single-reduction herringbone gear reducer that delivers 1300 hp at 500 rpm input.

The reducer is coupled to a pinion stand having three pinions with 23″ between vertical centers. Pinion ratio is 1 to 1. Horsepower is 825 at 86 rpm input.

When you require heavy-duty, high-efficiency drives, call your local D. O. James representative or write to the factory. You'll be glad you did.

D. O. JAMES GEAR MANUFACTURING CO.
1140 West Monroe Street, Chicago 7, Illinois
Since 1888, every type of gear and gear speed reducer

Below left — D. O. JAMES triple-reduction herringbone reducer with all-welded housing. *Below right* — D. O. James has facilities for producing herringbone gears to 60″ diameter, 20 to 2 DP.

D.O.James

...where you always get good gearing

Nuclear-Aircraft Status

President Kennedy's decision to take the nuclear aircraft out of the military program will not stop the project. In fact, the cutback may only amount to $500,000 a year. (Convair, GE and Pratt & Whitney are the major contractors involved.) Money to continue the project will come from the AEC and the Air Force's "kitty".

Security Causes Snags

Defense contractors are complaining to Congress that the nation's secrecy laws are slowing down important space projects. A major complaint centers on the dual security regulations maintained by different government agencies. These restrictions block the exchange of information between co-workers on different projects. Very often these men could use the same technology to fill the needs of similar projects.

Records up to 10,000°C

Designed for automatic measuring and controlling of temperatures up to 4000°C is a new pyrometer. With attachments, the device can operate up to 10,000°C. In addition to use in ceramic-factory ovens and steel mill blast furnaces, pyrometers are also used as research tools in the aerospace industries.

Review Brazing Progress

Advances in brazing during the past ten years are impressive. Brazing is now generally recognized as a science. With the trial period over, Battelle Memorial Institute now offers a comprehensive report of brazing's important gains for service in excess of 600°F.

More Remote Handling

Problems of remote handling, once the exclusive area of the atomic energy industry, are now of prime interest to aerospace industries. Systems must be devised for assembly, maintenance and repair of satellites, space stations and moon operations. Several techniques are in planning stages. Much of the hardware to be developed will be directed to hazardous-area operations in industry. Plans include: Manned operation, complete automation and use of closed-circuit TV.

Simulates Shop Operation

A new computer technique called "job shop simulation" is used by Hughes Aircraft Co. to eliminate costly trial-and-error methods of improving shop performance. The technique pretests management plans for providing more defense for less money. "An entire month's work can be represented on a computer in 15 minutes," says J. T. Pettit, director of Hughes' industrial dynamics. The result: No more uncertainty.

Glass at Its Strongest

Silica glass is the strongest bulk substance known. So says GE's W. B. Hillig. Its bulk strength is surpassed only by whiskers of graphite, iron and sapphire. Bend tests show strengths of more than 1.1 million psi. Tensile tests hit 1.92 million psi. These results far exceed previously reported strength levels of 0.53 million psi for bulk-form glass.

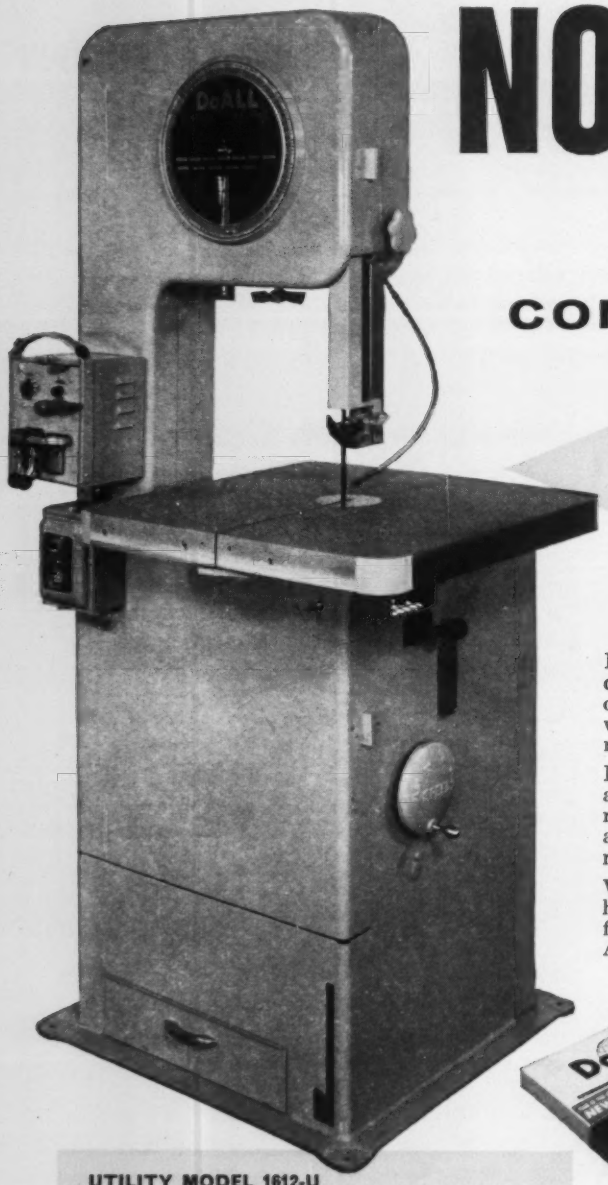
TV From Airplanes

"Stratovision" and "Ultracom" are two new words added to the Space-Age glossary by Westinghouse Electric Corp. "Stratovision" involves TV transmission from an airplane. Starting this fall, educational TV will be beamed to six states by this means. "Ultracom" employs ultraviolet light to send signals. It's being developed for communications in outer space.

Whiskers Take Heat

Sapphire "whiskers", combined with aluminum are new composites being developed to withstand the high temperatures of space and missile applications. Final objective is to obtain a strength to weight ratio of 600,000 in. at 2000°F. The aluminum bonds the high-strength sapphire fibers. Other composites planned will use steel or high-strength refractory metals as the base.

NOW — OWN A GENUINE DoALL CONTOUR MACHINE



ONLY

$995

New blades and wider speed range make it more versatile, more productive

It's a multi-purpose UTILITY machine with all the quality and operating features to make it the industry's outstanding buy. A real DoALL in every sense of the word. And a "must" for toolrooms, job shops, sheet metal, maintenance shops, etc.

Designed to take advantage of the increased cutting ability of the new Dart® blades, it has a wider speed range extending up to 5200 fpm. New heavy-duty drive assures smooth contour sawing of all machinable materials, and dependable accuracy under the heaviest cuts.

With a full line of accessories and attachments, you can handle a tremendous variety of work in metal sawing, filing and polishing as well as light gage friction cutting. Also for cutting plastics, fibrous materials, etc.

It's the kind of machine that starts earning money for you the day you install it. Call your local DoALL Sales-Service store today for a demonstration.

UTILITY MODEL 1612-U

offers 16" throat and 12" thickness capacity.

A larger Model 3012-U has 30" throat and 12" thickness capacity. Both machines have all-welded box frame construction; No. 10 butt welder; high-speed insert-type guides for band widths from ⅛" to ½", and other top-quality features. Both Model 1612-U and Model 3012-U are guaranteed by DoALL, world's leader in band sawing machines and band tools.

USES THIS NEW DART® BLADE

The Utility machine is capable of using the new Dart blade, which is guaranteed to outperform any make of carbon steel saw band. Specialized heat-treatment gives it a spring-tempered back and full hard cutting edge. Custom-welded to length with DoALL's exclusive process—guarantees strongest weld made and perfectly matched teeth. Set is guaranteed to within ± .002".

See it at ASTME Show, Booth 2222 New York Coliseum — May

B-66

This is a typical DoALL Store

The DoALL Company, Des Plaines, Illinois

Call Your DoALL Sales-Service Store

Close-ups Of INDUSTRIAL JAPAN

DAY'S WORK DONE: Workers at Nippon Kokan Co., Ltd., steel mill leave for home. Most work until 6 p. m.

Part 4

Japan Sets Steel Goals for 1970

In the next decade, Japan's steelmakers expect to double their present output levels.

But the Japanese don't plan to sell very much raw steel. Instead, they hope to export more manufactured products.

By Tom Campbell

■ "I've been working in the Fuji Iron and Steel plant at the Hirohata Works since 1952. They've been digging holes for expansion every day since I was hired."

That statement from a young metallurgical engineer sums up what's happening in Japan's iron and steel industry.

But it doesn't begin to tell what's coming up in the next 10 years. These future changes stagger one's imagination. They also will prove a delightful surprise to the companies who furnish Japan with ore, coal, scrap, technical assistance and heavy mill equipment.

Rapid Growth—The blockbuster that makes this picture perfectly believable is a sober estimate that Japan's steel output will go from 22-million metric ingot tons in 1960 to 48-million tons in 1970.

This figure was checked with Japan's top steel officials and with top government people. If anything, the estimate for 1970 may be low.

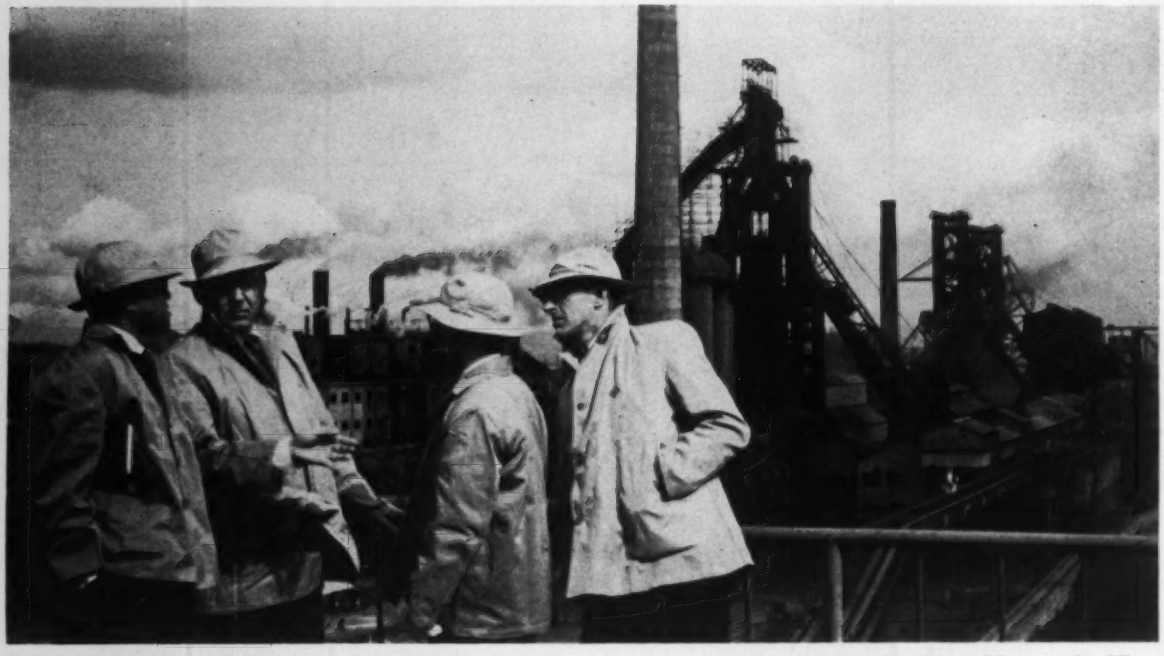
In a later story on trade and industrial expansion, reasons for this vast steel-output change will be spelled out. Generally, you might say it's a bursting expansion of economic activity. This activity promises to more than double Japan's gross national product by 1970.

As the writer tours the mills of Nippon Kokan and Fuji Iron and Steel, it's clear that new processes, better records and vast changes in product mix are in the making every day. No problem was encountered in getting into the mills. However, picture taking isn't allowed in the oxygen-steelmaking plants and in

NEXT WEEK

JAPANESE EXPORTS

Japan must import much of her raw materials and foodstuffs. To keep solvent, she has to export manufactured products. In Part V of this series, Editor-in-Chief Tom Campbell discusses Japan's export problems in world-wide trade.



GETTING THE FACTS: Mr. Nango of Fuji Iron and Steel takes Editor-in-Chief Tom Campbell on a tour of his company's steelmaking facilities. Here at the Hirohata plant, they discuss the raw materials picture.

some of the big rolling mills.

Few Secrets — These restrictions are placed by the licensors of the equipment. Otherwise, all questions are answered courteously.

A major help in understanding Japan's iron and steel industry is the courtesy and consultation extended by top plant officials, metallurgical engineers and representatives of the foreign relations section of each steel company. Mr. Yamada, manager of Yawata Steel, Japan's largest steel producer, even arranged for The IRON AGE'S Editor-in-Chief to tour two competing plants.

The dynamics of this steel expansion can be brought home by gaging what Japan is up against. In 10 years, she must construct 30 more blast furnaces.

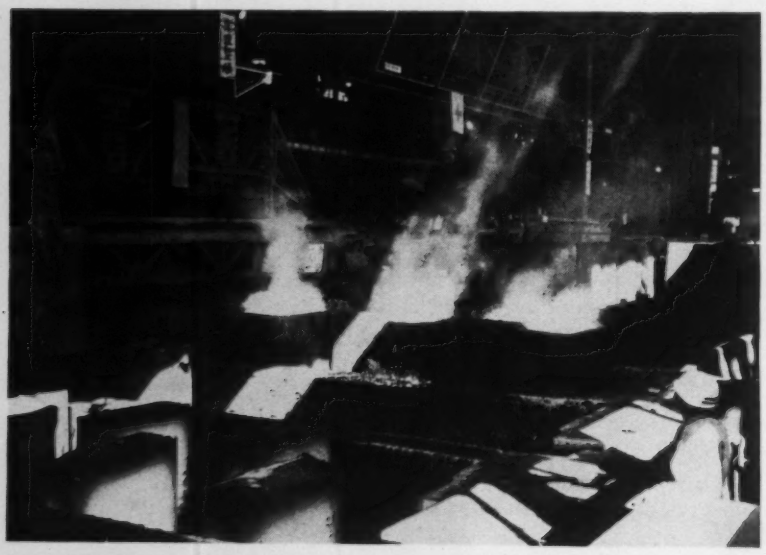
Also, she must boost the ratio of LD oxygen steelmaking versus openhearth. Today, this ratio stands at 4:1 in favor of openhearths. By 1970, it will be 3:2 in favor of the LD process.

Labor Shortage?—As if this isn't enough, Japan must find more labor. The birth rate has been dropping rapidly in the past 10 years. While there appears to be an abundance of labor today, the picture will change by 1970.

Mixed in with all this expansion is the need to make long-term arrangements for ore, scrap and coal. These plans must be firmed up as soon as possible. Japan's economy is growing so fast that no time can be wasted.

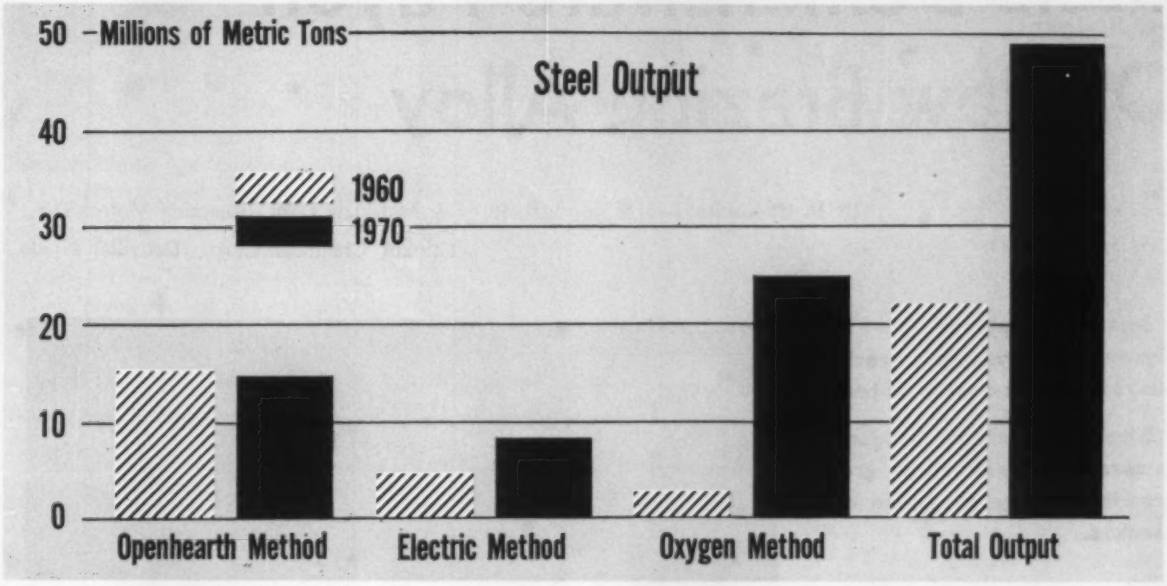
Now, let's consider exports of iron and steel products. They are a very small part of the total picture. Last year, Japan exported about 2.5 million metric tons of raw steel, out of a total production of 22 million tons.

There will be no change in this



TOP QUALITY: Rimmed steel is produced at Fuji Iron and Steel Works.

How Japan's Steelmaking Trend Shapes Up



MORE BLAST FURNACE: The dynamics of Japan's steel expansion can be brought home by gaging what the country is up against. By 1970, Japanese steelmen must construct at least 30 more blast furnaces.

total export figure by 1970. Japan prefers to export finished products, not raw steel.

Export or Starve—Only 15 pct of the land in Japan is arable. For this reason, Japan must import much of her raw materials and foodstuffs. In turn, she has to export manufactured items to keep solvent and make progress. There will be no change in this picture in the years to come.

In answer to the question: Will Japan dump steel into the USA, one must say "no." Of course, there will be exports to the West Coast. Last year, exports to the USA totaled 583,000 metric tons. Compare this figure with 656,000 tons in 1959; 388,000 tons in 1958; and 76,000 tons in 1957.

Japan is focusing on steel consumption at home. Here's her plan for 1970. Within 10 years, she expects the per capita rate of consumption to go up from its present 203 kg to 440 kg. Latest figures on other nations include: USA, 499 kg; UK, 336 kg; West Germany, 431 kg; France, 304 kg.

Major Factor — Of greatest importance to Japan's steel management is the need to increase productivity. The reason is the same as in the United States. Here in Japan, wages and fringe costs are going sky high. There's little chance that this spiralling effect will change.

When all the amenities are included, Japan really has a high wage rate. She must offset these high labor costs. Since a man often works for a company for life, Japanese business people are more conscious of the wage spiral than most American Iron and Steel Institute officers.

Using 1955 as an index figure of 100, Japan's iron and steel industry productivity index is now about 140. Back in 1952, the index was 73.

Big Push—Manhours per metric ton of blast-furnace pig iron have gone from 9.32 in 1952 to 5.54 in 1959. But Japan has to get this figure lower in the next 10 years. She is doing this by rushing through LD oxygen-process installations.

Japan also hopes to counter high labor costs by sintering more ore and using more oxygen in openhearths. Some 200-ton furnaces are now tapped in 5 hours.

The Japanese are also experimenting with direct-rolling processes and ore pelletizing at the supply site. Other plans even include apprenticeship programs.

More Autos—Amidst all this, Japan hopes to change her product mix to more flat-rolled steel. At present, autos take 5.8 pct of Japan's steel. By 1970, the country's automakers will need 8 pct of the total steel output.

Containers will go from 4.8 pct in 1959 to 6.2 pct in 1970. Construction now takes about 24 pct of total steel: It will dip to about 21 pct in 1970.

Japan will continue to make consumer goods for nations with high incomes; but future plans also center on the have-not nations. To develop a have-not nation, heavy industrial equipment is a must. The Japanese are ready to fill this need.

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Tests Demonstrate Payoff Of New Brazing Alloy

By **R. C. Kopituk**—Manager Metallurgy & Materials Dept., Reaction Motors Div., Thiokol Chemical Corp., Denville, N. J.

Before acceptance into the high-temperature ranks, brazing alloys must pass a series of tests.

Strength, ductility, tendency towards undercutting, grain growth and age hardening are checked.

▪ Brazing materials for space applications must meet the criteria set for Space-Age metals.

Good mechanical properties, wear and corrosion resistance at temperature extremes are vital. High-temperature brazing alloys must also have top self-fluxing properties to preclude the need for special cleaning practices after brazing.

Combines Advantages—Recently developed is a manganese-base alloy which combines many of the advantages of both silver and nickel high-temperature alloys.

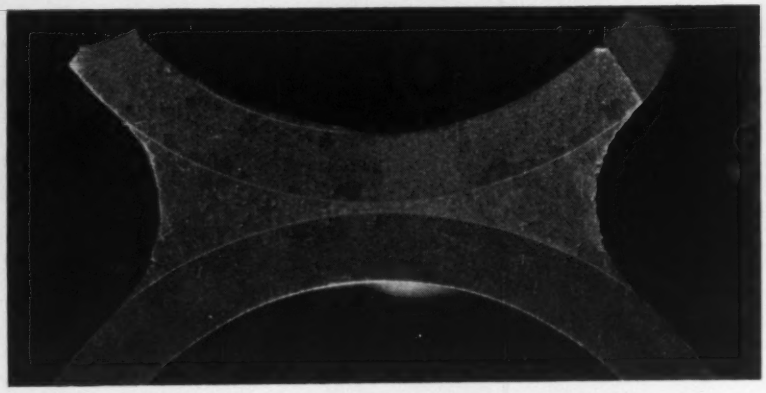
Called CM 62, the alloy contains about 16 pct Ni, 16 pct Co, less than 1 pct B and about 67 pct Mn. It was developed by Coast Metals Inc., Little Ferry, N. J.

A number of tests, centered on the brazing of Type 347 stainless steel thin-wall tubing, highlight the key features of the new alloy.

When Will It Flow?—Flow and wettability studies show CM 62 to be comparable to AMS 4777, a standard brazing alloy. Optimum flow temperatures are between 1850°-1950°F.

The effect of large fillets on grain growth, undercutting and braz-alloy penetration were also studied.

Little or no undercutting results when using large fillets of CM 62, as the first photograph shows.



NO UNDERCUTTING: Section of brazed stainless steel tubes shows no undercutting when brazed with new alloy. Also, grain size stays small.

No Grain Growth — Grain size remains small during brazing. Because brazing was conducted at 1950°F, it indicates that CM 62 promotes little or no grain growth while quite the opposite is true of many other high-temperature brazing alloys.

Some brazing alloys combine quite readily with the base metal. Does CM 62? Furnace brazing tests were run on Type 347 stainless at 1950°F for 15 minutes. Tubing was cylindrical in cross-section. Adjacent tubes had line contact during brazing.

Melting Point Rises—It's expected that the braze alloy will combine readily in that area where tubing has line contact. But how much alloying occurs in the fillet area?

Results show the remelt temperature to be about 2250°F. This increase in melting point over 1950°F indicates that some elements of the higher-melting-point base metal diffuse into the brazing alloy.

Bending brazed tubing until failure of the joint occurs is a good measure of ductility. Bending is around the axis of the line of braze created in bonding the tubes together.

The CM 62 alloy passed the test whereas a high temperature Ni-Cr-Si-B alloy failed after a 10° bend.

Undergo Strength Tests—A joint strength comparison was made between sections of tubing longitudinally brazed with CM 62, AMS 4777 and a proprietary high-temperature nickel-base brazing alloy. Care was taken in designing the fixture so that a minimum of eccentric loading occurred.

The load was applied perpendicularly to the line of brazed joints. Mandrels, fitted inside the tubes, minimized bending during loading. The width of the gap was 0.003 in.

Strengths of the CM 62 joints were 2900-4500 lb/lineal in. Joint

strengths of the AMS 4777 and the other high-temperature nickel-base brazing alloy were 1400 and 2200 lb/lineal in.

Some Joints Age — There's another point to consider. Certain manganese-base brazing alloys are susceptible to age hardening. Thus, it's important to know how various heat treatments will affect properties of the CM 62 joints.

Several test pieces were made. Each, consisted of three stainless steel tubes 7 in. long and ⅜ in. OD. After furnace brazing at 1950°F, the test pieces were heated at temperatures ranging from 300°-800°F for one hour.

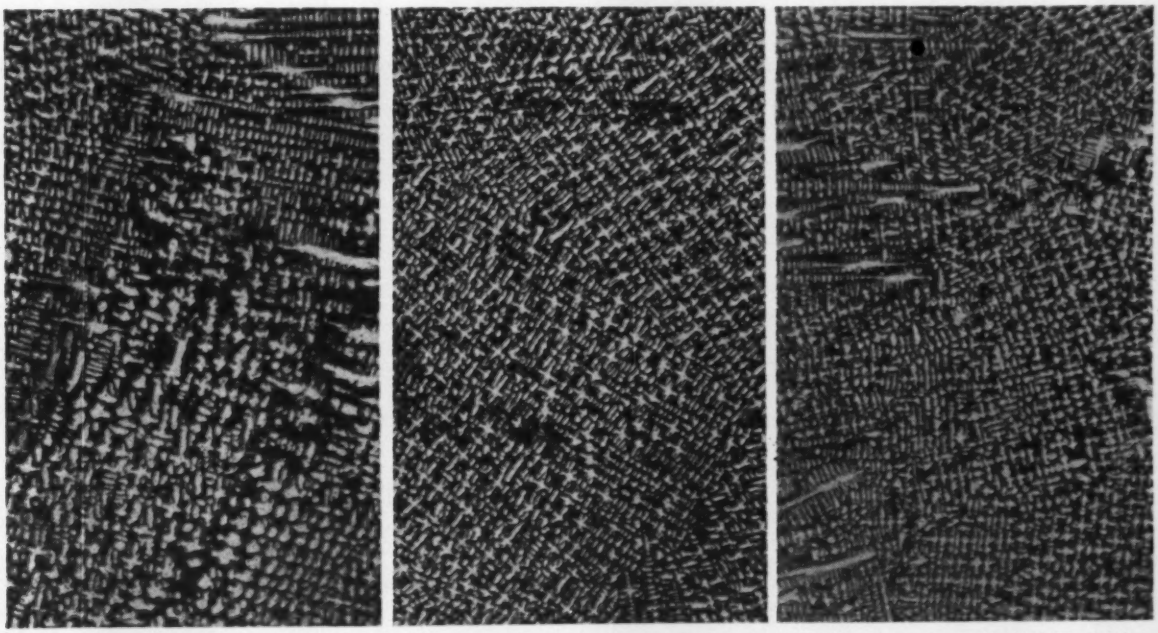
Microhardness and tensile tests show that furnace-brazed or braze-welded CM 62 joints do not age-harden when brazed under the conditions imposed.

ALTERS STRUCTURE: Microstructure of CM 62 changes markedly after Inconel-X heat treatment. But there's little effect on tensile properties.

Shows No Effect—How does the microstructure respond to this heat treatment? Photomicrographs of the heat-treated specimens show no change in filler-material structure.

Because one immediate application for the new brazing alloy was for an Inconel-X component, the effect of the Inconel-X heat treatment upon the brazed and braze-welded joints was also studied.

Microexamination reveals a marked change in the structure of the CM 62 weld bead only. The top photograph shows that the usual dendritic structure has been replaced by one consisting mainly of needle-like constituents. However, this change in structure had no effect upon tensile properties.



STAYS THE SAME: Dendritic structure of as-welded CM 62 alloy undergoes no change in structure after heat treating at 400°F (center) and 800°F (right). Tensile tests showed that no age hardening occurred.

ON LAND: Chemical-coated steel piling is inspected (left) to gage its abrasive resistance. Close-up shows residual soil that adheres to the piling. After several days underground, the coating has no breaks.

Easy-to-Apply Resin Coatings Block Corrosive Attacks

Chemical coatings provide effective barriers against capital-shrinking corrosion.

Like paint, the new coatings are easily applied with spray guns, rollers or brushes.

■ Corrosion eats away millions of dollars worth of capital investments every year. Acids, caustics and salt air are three of the major villains behind this excessive waste.

Every time a corroded part has to be scrapped, replacement costs seem to get higher. These soaring costs helped to initiate private research which led to a new chemical coating. This coating serves as an effective barrier to withstand the ravages of corrosion.

Easy to Use — Called Permaspray, the newcomer is the result of 8 years of experimenting and testing under field conditions. A product of Leonetti Enterprizes, Houston, it can be applied like paint with a spray gun, brush or roller.

Permaspray coatings protect metal, concrete and wood surfaces. Each coating consists of a blend of resin-forming liquids, suspended in solvents to ease application. These coatings harden by chemical action, not by solvent evaporation.

A liquid activator starts the chemical action. The time between adding the activator and final polymerization is called the working time. During this period, while Permaspray is in the liquid state, you can apply it to almost any metal, wood or cement surface.

Basically, Permaspray is black in color. However, it can be covered with lacquers or oil-base paints for decorative effects.

No Oxidation—Ultraviolet light and weather don't affect the new chemical coatings. Why? Because Permaspray contains no volatile plasticizers which slowly evaporate or oxidize.

Actually the toughness of a Permaspray coating increases with aging. Chemical resistance also improves as the coating sets up in the field.

What can Permaspray do for you? Among its advantages the foremost is an ability to resist—for long periods—attacks by corrosive liquids and gases, moisture and salt sprays.

Rugged Example—Let's consider a case in point. A Permaspray coating was applied to a hydrochloric-acid glass blower, installed in the waste-acid-recovery unit of a Gulf Coast plant. This test coating withstood weather and acids for 3 years before breakdown signs began to appear.

Permaspray dries in 3-4 hours. Thus, you can often apply a second coating on a high structure without changing scaffolding. If a coating is broken, it may be field patched.

A few of the wide uses for the new chemical coatings include: Refineries; chemical and food-processing plants; ships; railway equipment; and standing structures such as bridges, petroleum- and gas-storage tanks, and power-distribution stations.

One gallon of Permaspray covers 400-500 sq ft. On properly prepared surfaces, two coats insure optimum protection. A continuous film even resists the small molecules of corrosive gases and liquids.

Three Stages—Normal application of the new chemical coatings centers on three working stages. First, you mix Permaspray's primer in its own can prior to use. If you spray the primer, a pot pressure of 32-36 lb must be maintained. For best results, all primer coats should be covered with Permaspray CPB-100 within 24 hours.

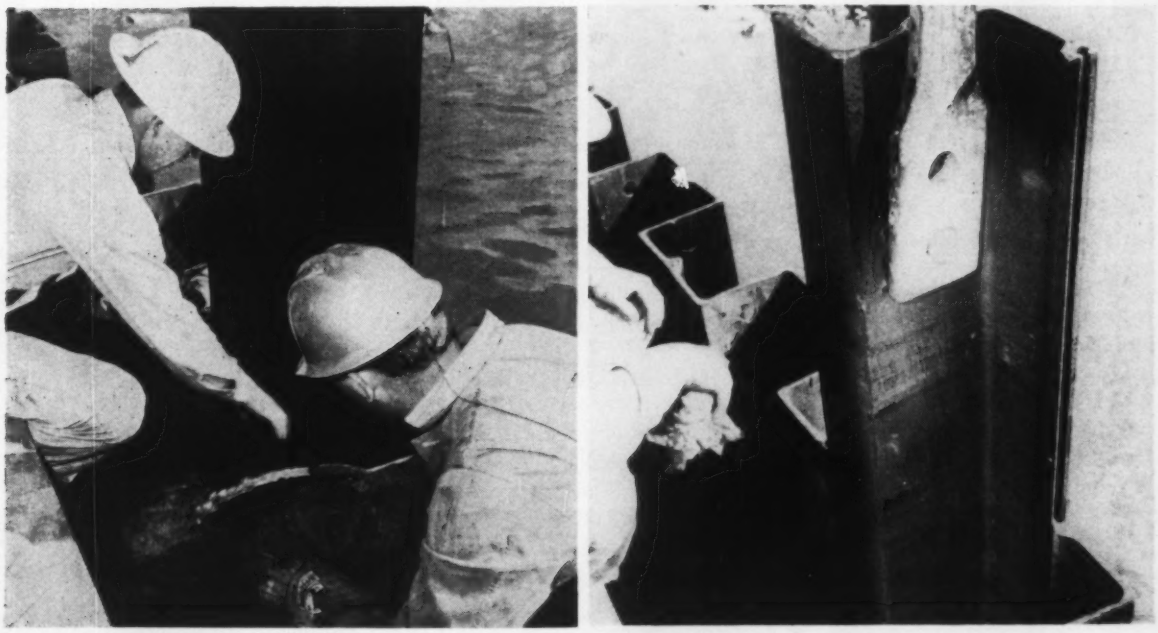
Just prior to using Permaspray, a catalyst is added to the can. When adding the catalyst, avoid excessive stirring. Agitation increases the catalytic reaction. This reduces "pot life" or working time.

Two coats of Permaspray black should cover all bare spots. Apply each coat to a wet thickness of about 4 mils. As soon as the first coat gets tacky or caps over, the second coat can be applied.

Permaspray coatings get tougher as they age. After drying, these coatings resist heats up to 200°F.

Note Corrosion Resistance

COATED PART IMMERSED IN . . .	PROTECTION	COATED PART IMMERSED IN . . .	PROTECTION
Acetic Acid	Excellent	Hydrochloric Acid	Excellent
Aluminum Sulphate	Excellent	Hydrofluoric Acid	Good
Ammonia	Excellent	Kerosene	Excellent
Barium Chloride	Excellent	Nitric Acid, 10 pct	Poor
Calcium Bisulphate	Excellent	Phosphoric Acid	Good
Carbon Tetrachloride	Excellent	Salt Water	Excellent
Caustic Potash	Excellent	Sodium Hydrochlorite, 5 pct	Good
Chromic Acid	Poor	Sulphuric Acid, to 60 pct conc.	Good
Fuel Oil	Excellent	Tannic Acid	Excellent
Gasoline	Excellent	Turpentine	Excellent



AT SEA: To check salt-water resistance, a coated piling is withdrawn after 3 days of torture. Workmen wash down the piling (left) and inspect its surface. Thin, 7-mil coating shows no signs of damage.

HOME OFFICE: Seated at the controls is Mark Lowell, Crane Co.'s manager of data processing. C. H. Lovlace, vice president of the Ind. Prods. Group (left) and general manager D. R. DeVeaux look on.

Computer Adds Efficiency To Inventory Control

Competition is stiff. Data processing might be the tool you need to keep abreast of the market's changing cycles.

Computers can help you make a product faster, ship it sooner and build overall efficiency.

■ A high-speed communications link between field sales and manufacturing has been developed by the Industrial Products Group of Crane Co., Chicago.

Early this year, the group began using a data processing system which provides one central source of inventory control. Included in the scheme are two manufacturing centers, two stock warehouses and a national marketing network.

The whole system is based on a model 220 electronic computer, a product of Burroughs Corp., Detroit. It keeps track of about 6000 of the division's finished products. These items are stocked in Crane Co.'s manufacturing centers at Chicago and Chattanooga, Tenn., and at warehouses in Los Angeles and Houston.

The computer also keeps an eye on stocks used in production at the company's plant in Chicago. The job here is to account for close to 18,000 types of raw materials, subassemblies and assemblies.

Just the Beginning—D. R. DeVeaux, general manager for the Industrial Products Group, believes that Crane Co. is just scratching the surface of the computer potential. Up to now, the unit has been used mainly to contain a large mass of statistical data and boiling it down to comprehensible size.

But Crane executives look for it to become more prominent in high-level jobs where the computer can actually make marketing and manufacturing decisions.

A major manufacturer of industrial fittings and plumbing fixtures, Crane Co. began spadework in electronic data processing about three years ago. At that time, it started with a small punch-card computer for use in certain accounting routines. As the system began

STOCK ON HAND: Thousands of items in the warehouse await instructions from data processing system. They'll then be packed for shipment.

to absorb more jobs, management felt the need for a more advanced setup.

High Capacity — The choice of the new Burroughs unit seems to fill the bill. It's a high-capacity device with a magnetic core storage potential of 10,000 words. The system also has a magnetic tape storage with a capacity of 500 million digits.

Its Cardatron buffering and editing system jibes well with the company's old punch-card setup. The latter remained in use for a brief period. The new computer also comes equipped with input and output for punched paper tape. This feature means that the new system can be implemented slowly. There's no need to drop the punch-card system suddenly.

The new unit was installed in the Chicago plant in March 1960. Within six months, the computer was being run on a full shift on a work-a-day basis. By then, it was compiling a 4000-man payroll. Other jobs included labor distribution and efficiency, cost accounting and production process control at the Kedzie Ave. plant.

The holdover core of trained employees that had worked with the small computer helped make an easy transition to the larger model.

Valves and Fittings—In the two manufacturing plants of the IP Group, about 10,000 different kinds of finished and semifinished valves and fittings are produced. Destined for customers such as oil refineries, chemical plants and defense projects, many of these parts are very complex and costly.

To build these items, Crane Co. must keep nearly 18,000 basic parts on hand. Of course, accounting had its hands full keeping track of them. What did they cost? How many were in stock? Where were they used? Answers could be given, but management wanted faster results.

It has been difficult to tell, for

CYCLE BEGINS: Inventory control process starts when operator punches the order data onto paper tape.

FILES OF FACTS: Inventory on all parts and finished products is stored on magnetic tape reels.

instance, if a part was understocked or in surplus. Also, what was its cost of production?

Popular Items — When you're dealing in finished products, there's always the danger of having too much capital tied up in nonmoving inventory. On the other hand, you can lose a customer if the stock is missing from the shelf.

Then, too, a better system of control was needed for custom-made products. The time lag between the original sale and the final delivery had been too great.

The computer answers all of these problems. Here's how the centralized data processing system works. Information on finished products is now carried in magnetic tape storage by the computer. What sort of information? Facts such as the number of products in stock, where they're stored, the number on order and production cost.

New Business—Orders from the field are mailed into the closest of the four installations of the IP Group. Flexowriters punch the order data onto paper tape. The shipping order is typed at the same time.

A leased telephone wire then transmits the tape to the Chattanooga plant if the main supply center in Chicago decides to fill the order there. The two warehouses mail their tapes to Chicago.

When the tapes arrive in Chicago, the data contained on them are fed into the computer. The unit updates the proper product ledger in its magnetic tape memory. This system, simple as it sounds, bridges the gap between sales and manufacturing.

What a Memory—As soon as the supply of a finished product falls below a preset order point the computer begins its process control function. For each product, the computer retains in its memory a complete rundown on what it takes to produce that item.

DOUBLE CHECK: Supervisory personnel perform spot checks of part stocks on hand against the number listed on computer records.

If the computer detects a "broken" order point, it kicks out a job packet of punched cards. These cards contain complete details on replacement production.

These same cards initiate the production process through the entire Chicago plant. They are also used to keep the records up-to-date on parts' inventories. As with finished products, when an order point for any of these parts is broken, the computer begins arranging for replacements.

Warns the Buyer — If there's a shortage for an assembly, the computer breaks out another packet of process control cards, thus directing the work required to stem the shortage. The breakdown continues until raw stock or parts from outside vendors is needed, in which case purchasing agents are alerted.

The computer can run through the records kept on these parts and produce a complete production forecast and labor bill in 15-20 hours. Using the small computer, this same job took six weeks.

Management at Crane Co. is eyeing other duties for the advanced unit. One is sales forecasting, with the promise this holds for more efficient production planning. The system could dope out what sales are likely to be months ahead of time. Then the stocks could be adjusted accordingly.

Pay Day—The computer is also expected to take a more prominent hand in payrolls and labor cost accounting. Crane Co. also plans to use the system for parts standardization. Suppose some part is used in only one or two products. The computer might find a more widely used part as a replacement.

Direct production control is expected to become another province of the computer. Studies are now underway by Crane Co. on such jobs as machine use, departmental efficiency and even the routing of stock and labor.

According to Crane officials, use of the computer has given the company an edge over its competition.

New Bearings Free of Friction

Compact Designs and Easy Installation Open New Areas of Use

Friction-free bearings can serve in hundreds of industrial and aero-space applications.

Here are two new package types, built to precision, that slip into place with little effort.

■ Where a system's efficiency would be raised by using non-friction bearings, The Bendix Corp.'s Utica Div., Utica, N. Y., feels it has just the device. It's called the flexural pivot.

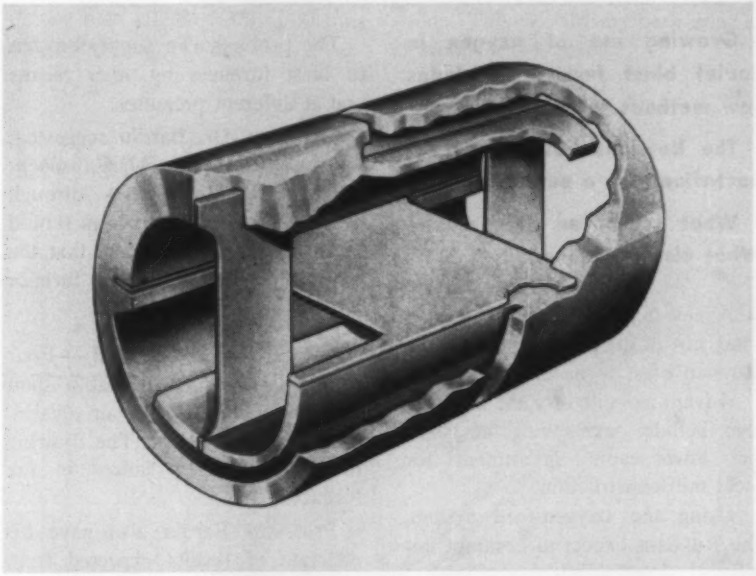
The friction-free device's operation centers on flat steel springs which form a web between two separate "halves" of a tubular bearing. The tubes' flexing ability allows movement—up to 60°—without the tube halves making contact.

Designers' Note—Bendix officials claim the unit meets the requirements tests for use in missile altitude control devices, rocket-steering units, gyros, air-data sensors, scales and recording galvanometers, to name just a few.

There are two types of the flexural pivot: A cantilever type which supports overhung loads, and a double-end support type to bridge-support a central load. The pivot consists of two concentric cylindrical sleeves with cutaway sections interconnected by two flat crossed springs.

The outer sleeves, separated into sections along the main longitudinal axis, permit relative rotation within the specified range. The pivot is used as a bearing by clamping or otherwise securing the linkage arms of the load to each section of the outer sleeve.

In the cantilever type, one end can be rotated relative to the other end, while in the double-end support type the two ends are connected. Thus, they can be rotated relative to the center section.



CANTILEVER TYPE: This friction-free bearing supports overhung loads. The pivot's two concentric cylindrical sleeves contain cutaway sections which are interconnected by two flat crossed springs. Lubrication isn't needed.

Precision Made—The unit operates without backlash and hysteresis. In addition, no lubrication is needed and dirt does not affect its operation.

The unit will also operate at maximum efficiency in an environment of radiation, high temperatures, and in a vacuum. These features make it particularly adaptable for use in space vehicles.

The non-friction bearing features a low spring constant, high electrical conductivity, and it's simple to install since only mating parts need be machined. The unit also has high lateral and radial rigidity, as well as low torsional rigidity.

Wide Size Range—A series of seven bearings is already standardized. They include the following diameters in both pivot types: 5/32, 3/16, 5/16, ¼, ⅜, ½, and ¾ in. Other sizes are being tested—one smaller than a matchhead.

Through the use of new alloys, special bearings will be designed as the need arises.

Tests conducted by the engineering department with specially designed equipment indicate that the center shift, due to rotation, is very small.

Bendix uses the flexural pivot in its automatic flight control systems. Here the unit requires only the support corresponding to the bearing housing. Bores are held to within 0.005 in.

The unit, which has a self-contained preload mechanism, also serves as a shaft. Preloads are set by rotating the pivot.

In a Bendix Eclipse-Pioneer Div. air-data sensor application, the new pivot is installed with only three screws. This replaces a ball-bearing assembly consisting of at least 12 parts. Other uses include: Transducers, computers, linkage and lever systems and gages.

Russians Alter Blast Furnaces To Improve Oxygen Injection

Growing use of oxygen in Soviet blast furnaces includes new methods for feeding.

The Russians have great expectations for a new design.

What prompted this move? What else is planned?

■ A new oxygen-feed system is a vital part of the plans for improving Russian blast furnaces.

Advantages cited for the new system include: coke savings of 10-15 pct; lower capital investments for steel mill construction.

Using the oxygen-feed system, the Russians expect to obtain a no-silicon, low-sulphur, semifinished metal at 1450°C.

Explains the Trend—A recent article in Metallurg, a leading trade publication of the USSR steel industry, points up the thinking behind this development.

"All the possibilities for intensifying ferrous-metallurgy by the use of oxygen are far from realized." So wrote Ivan Bardin, then vice-president of the USSR Academy of Sciences.

Oxygen, he wrote, should be used when smelting converter pig iron in blast furnaces and for preliminary purification of pig iron before charging into steel smelters.

Semifinished Metal — The need for supplying openhearths and converters with semifinished products free of silicon, low in sulphur and at a high temperature was a major factor in directing the new oxygen-feed program.

Previous studies on oxygen showed that the zone of the unprepared charge in the furnace center sinks lower than during work without oxygen.

The problem: To supply oxygen to blast furnaces by other means and at different pressures.

One way, Dr. Bardin suggested, is to feed oxygen to blast furnaces under 8-10 atmospheres through special lances. These lances should be installed in such a way that the oxygen penetrates to the furnace center.

Where They're Located — Four sliding lances, installed at a slant and mounted below the air tuyeres, make up one design. The drawing locates these new lances in the furnace.

Professor Bardin also gave his estimate of results expected from their use.

"It can be presumed that with such an oxygen feed the blast furnace hearth will be more than a metal hopper. Instead, it will be an active part of the furnace with an oxidizing atmosphere which burns out silicon, sulphur and carbon.

Try Air Cooling—"Hearth temperature is raised about 200°C. However, stability or working safety will not be lowered.

"Moreover, air cooling of the hearth and well will, in the future, give reliable hearth operation even with the use of ordinary high-alumina refractories."

Dr. Bardin also noted that together with oxygen, natural gas could also be supplied to the blast furnace.

How Will It Help?—He could not predict how operation of the blast furnace will be changed when the plan for feeding oxygen to the hearth has been put into practice. The new technology has to be tested in production conditions. Then, process traits and difficulties will be clear, he wrote.

"It can be assumed, though, that this system will make possible a cut in coke consumption by 10-15 pct. Simultaneously, the use of natural gas will be raised."

Speed Conversion — Moreover, the use of a high-heat semifinished product in the steel smelting shops will greatly speed the conversion of pig iron into steel, the Russians believe.

Dr. Bardin estimated that with the new oxygen feeders three blast furnaces of 1.5 million ton annual capacity and four open hearths with melting charges of 1000 tons working on semi-finished metal are enough for a steel mill of 3.5-4 million tons annual output.

At such a plant, he added, the pig iron will be transported from the blast furnace to the steel smelting shop in ladles of 250-ton capacity. Mixers will be unnecessary.

Automation Is a Means—Other ways to intensify the steelmaking process were discussed by Dr. Bardin.

For example, increasing the size of plant facilities has reached the point of diminishing returns, he wrote.

He also cited automation as a means to boost production without increasing plant capacity. The Russian steel industry has a large-scale automation program. Slated for automatic controls are 250 ore-mining units, 114 blast furnaces, 177 openhearths and 45 rolling mills during the present seven-year plan.

Another Approach — Beneficiation of iron ore is another means

which Ivan Bardin regarded as of prime importance for improving blast furnace operation.

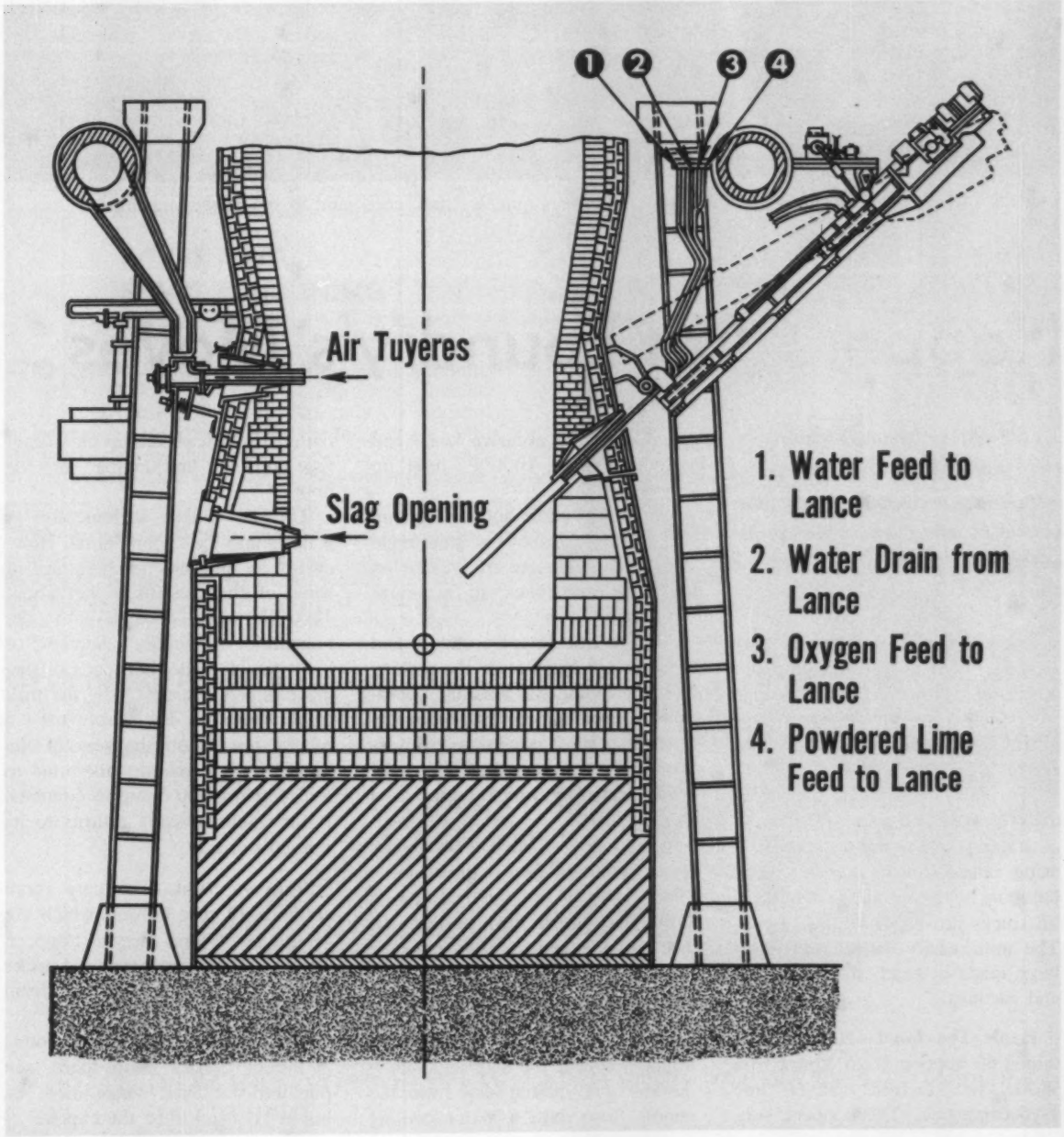
"The working practice of metallurgical plants during recent years has demonstrated what an immense role the beneficiation and sintering of raw materials, and the preliminary preparation of the furnace charge, plays for the blast furnace. Use of self-fluxing agglomerate has also proved effective.

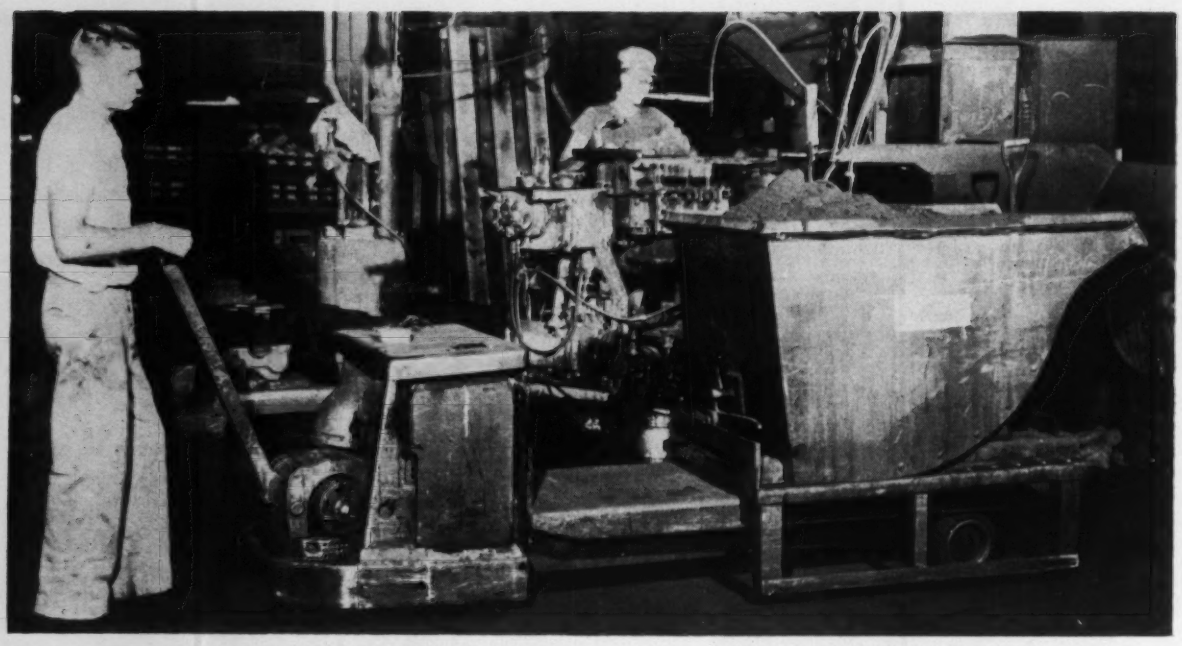
"The impact of prepared ores for blast furnaces will be even greater when unit capacity is increased. When, for example, the area of the agglomeration machines is brought up to 240 square yards productivity of one belt will be 5000-6000 tons of agglomerate per day."

Simplify Steel Pouring — Efforts are being made not only to lower capital expenditures and use of refractories, but also to simplify the pouring of steel.

In order to facilitate pouring, Dr. Bardin suggested, the weight of ingots should be increased to about 20 tons. This has already been done at several Soviet plants.

Where Oxygen Enters Furnace





SAVES TRIPS: Specially designed self-dumping hoppers quickly truck core sand to the blower machines.

Hoppers Aid Foundry's Moves

Portable self-dumping hoppers can raise handling efficiency.

The hoppers handle many jobs at the foundry where complete automation wouldn't be practical.

■ Every foundry owner dreams of someday having a fully-automatic operation. However, the savings from such a system do not always justify the capital outlay needed to create it.

Newnam Foundry Co., Inc., Kendallville, Ind., sought other ways of stepping up handling efficiency, using partial mechanization. Self-dumping hoppers and a fleet of fork-lift trucks proved to be the answer. The units easily collect and move large loads of sand, slag, iron pigs and castings.

Hauls The Load—Newnam obtained 60 hoppers from Roura Iron Works, Inc., Detroit, with ¾- and 1-yd capacities. The hoppers, subjected to heavy abrasive loads and temperatures to 1000°F, hold up very well.

Units that handle hot castings and slag are reinforced by two steel angle irons. The supports are welded on the sides and back to minimize warpage.

Most of the hoppers collect and move hot castings from the picking line to grinding and finishing operations. Depending on size and variety of castings being poured, as many as 20 hoppers are positioned along the apron conveyor which serves as a picking line.

As a hopper is filled, a fork truck moves in and takes it to the cleaning area. Castings are dumped into a skip hoist which feeds a tumbler. The empty hopper is then returned to picking line.

Handles Hot Slag — In another area of the foundry, the 1 cu yd hoppers collect the slag and pile it outdoors. A molten slag from the cupola flows into a water cooling bath. It's then picked up on a drag-type conveyor and dumped into the hopper.

The slag usually agglomerates as it flows into the cooling tank. However, the internal temperature of some of the clusters is still about 1000°F when placed into the hopper.

At the slag pile, hot loads of slag are dumped effortlessly by the fork truck operator. He simply trips a release handle on the rear of the hopper. This permits the unit to rock forward and dump its contents. It then automatically returns to its upright position.

Conveys Sand—The core room contains 12 core blowers which are supplied with sand-carrying hoppers. Battery-powered platform trucks bring full hoppers of core sand from the muller.

Hoppers are also used outdoors. A mobile derrick crane loads iron pigs into the units. Once filled, the hopper is trucked to the cupola.

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DYNAPAK MODEL 1220 . . . massive, rugged all-new model of industry's only proven *high energy rate forming* machine! All-new Dynapak saves expensive metal chips — eliminates costly machining.

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SAVES TIME

DYNAPAK MODEL 1220 is designed and built to work a full day *every* day . . . efficiently, dependably, economically! Dynapak uses only one-quarter of its available energy to exceed the force of a 6,000-ton press—always has power in reserve. Models with operating capabilities up to 8 strokes per minute are available.

DYNAPAK MODEL 1220 is versatile—makes a wide variety of products ranging from production tooling to complex turbine blades, missile nose cones and tiny precision surgical pins. Tool steel and the exotic "problem" metals become everyday materials to Dynapak's unique capabilities.

DYNAPAK MODEL 1220 can help *you* do a better job of forging, forming, compacting. Dynapak can help you cut costs and improve profits. Find out now about dependable, performance-proven Dynapak — the new concept in *high energy rate forming*. Write, wire or phone for complete information.

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First choice in heavy-duty tank cleaning—hard-working Oakite "24"

Users everywhere agree that their best way to clean iron and steel parts is to tank-soak them in a hot solution of heavy-duty Oakite 24. This hard-working alkaline cleaner gets under the dirt layers and literally tears the soil from the surface. Despite excessive soil contamination of solution Oakite 24 maintains proper pH level and provides long, effective cleaning action.

Oakite 24 is but one of a wide range of alkaline tank-cleaning compounds. Others include medium and light duty oil and grease removers; self-emulsifying solvent cleaners specially designed for removing buffing compound residues, pigmented drawing compounds and other tenacious burned-on solid-particle dirts and smuts. Also available is a useful selection of materials for cleaning brass, copper, aluminum, magnesium, lead, tin and zinc.

Which is best for you? Only you and the Oakite man together can decide. It depends on your equipment, the parts you process, the next production step. Ask the Oakite man. From over 30 materials, you're *sure* to get the one cleaner that works most efficiently for you. Write for Bulletins. Oakite Products, Inc., 34G Rector Street, New York 6, N. Y.

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SCIENCE

over 50 *Est. 1909*

years' leadership in industrial cleaning

NEW PATENTS

Fast Slag Forming

Method for rapidly forming or transforming slag in an open-hearth furnace, B. Trentini (assigned to Institut de Recherches de la Siderurgie, Saint - Germain - en - Laye, Seine-et-Oise, France), Jan. 17, 1961. To hasten dissolution of lime in a ferrous bath in an open-hearth furnace, part of the lime is added as lumps in the scrap-ore charge. The remainder is finely powdered and injected in the oxygen gas after the first slag is formed. This avoids frothing and the formation of lime blocks in the slag. Canadian 612,-784.

Stainless Alloy

Transformable stainless steel, A. M. Hall, D. C. Ludwigson, D. B. Roach and V. W. Whitmer (assigned to Republic Steel Corp.), Jan. 10, 1961. A stainless-steel alloy, having high strength and hardness, comprises preferably 15-17 pct Cr, 4-6 pct Ni, 2-2.5 pct Mn, 0.1-0.15 pct C, 0.3-1 pct Si, 2-3 pct Mo, not more than 0.4 pct V, 0.5-1.5 pct Cu, 0.02-0.2 pct B, and the balance Fe, but containing not over 7.5 pct Ni and Mn combined. U. S. 2,967,770.

Raises Carbon Content

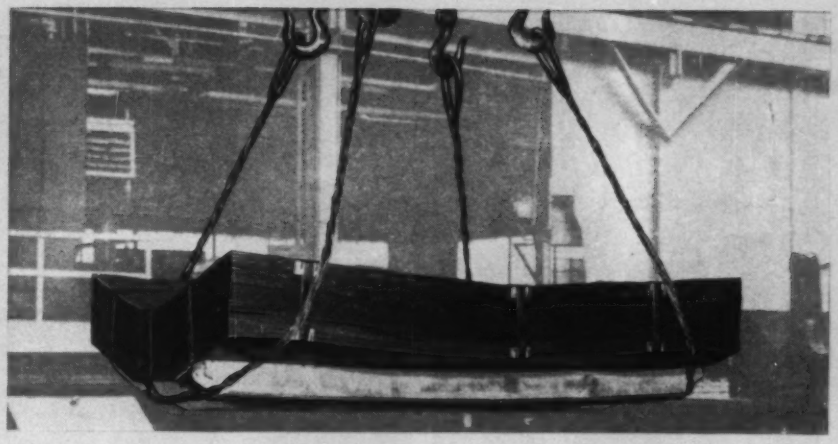
Carburizing procedure, W. E. Engelhard, Mar. 14, 1961. A process for carburizing low-carbon steel articles accurately increases surface carbon content by a predetermined amount. U. S. 2,975,083.

Quench Agglomerates

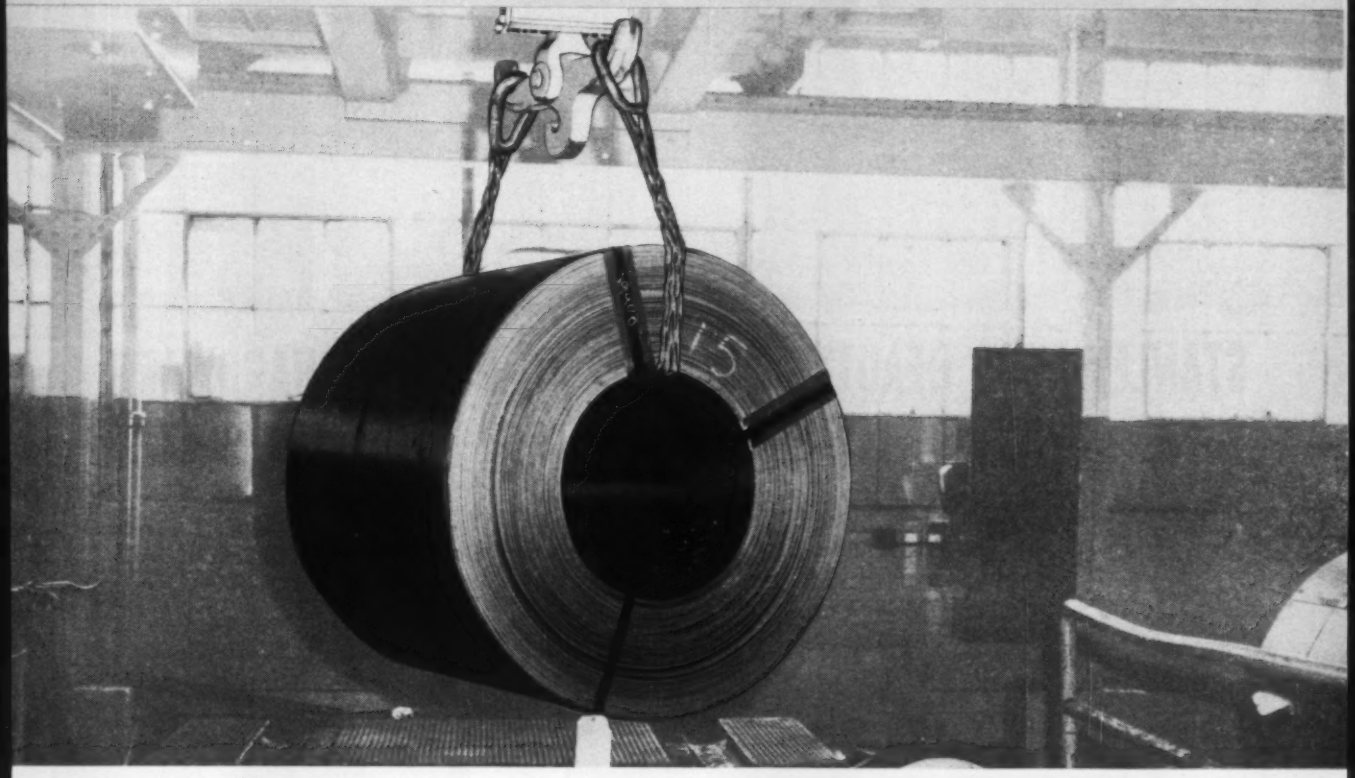
Process for quenching hot, iron-powder agglomerates, J. C. Agarwal and W. L. Davis, Jr. (assigned to U. S. Steel Corp.), Mar. 14, 1961. A controlled water-quench method cools hot iron-powder agglomerates and prevents their reoxidation. U. S. 2,975,086.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington, 25, D. C.

Two M-1-BB Yellow Strand Braided Safety Slings, each 8 parts of 1/4" wire rope, easily handle this 12,800 lb. load of sheet steel. Sharp edges make this an extra tough sling assignment.



Fourteen parts of 1/4" Yellow Strand make up this special Flat Braided Safety Sling carrying a 19,900 lb. coil of steel. The right blend of strength and flexibility is of paramount importance here.



The tougher the load, the better the reason for using Yellow Strand Braided Safety Slings

Why Yellow Strand slings? First you get the expert help and advice of experienced Yellow Strand sling experts in selecting the best sling for your specific task. Then your sling is constructed of rugged Yellow Strand wire rope. What's more, your sling is custom-built by experienced Yellow Strand sling craftsmen. The result is a strong, durable sling built specifically for your job. Call on your Yellow Strand sling expert anytime.

Yellow Strand®
BRAIDED SAFETY SLINGS

BRODERICK & BASCOM ROPE CO.
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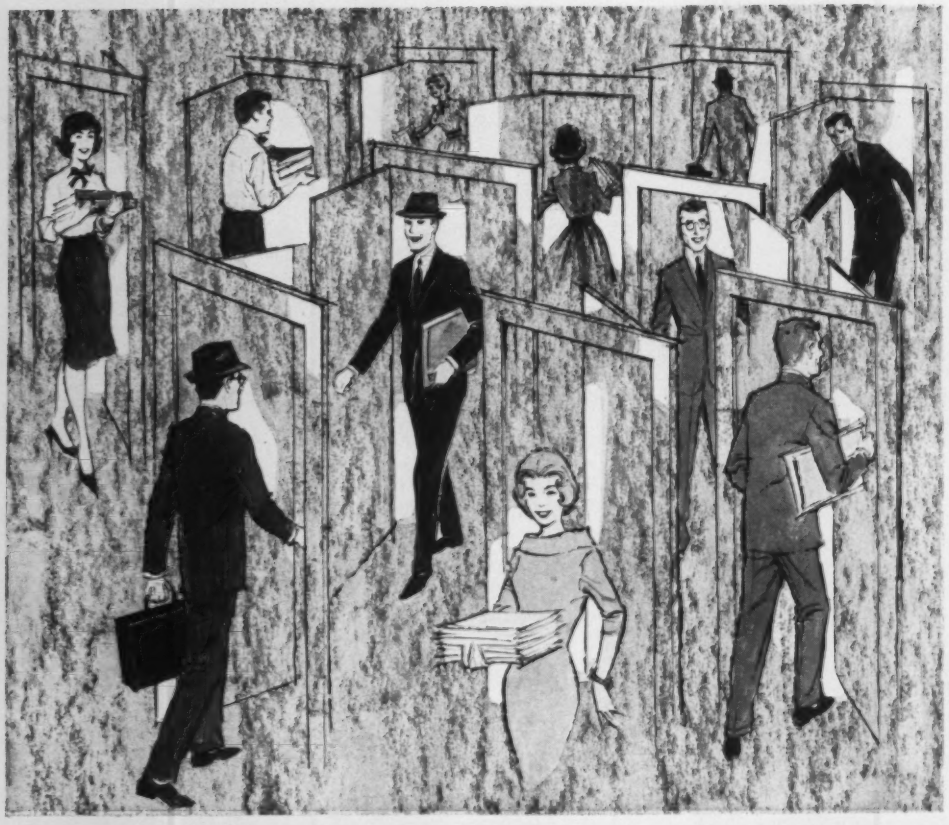

Open Sesame

Tens of thousands of doors of every description, in many of the most distinguished homes, commercial and office buildings, are equipped with the famous hinges produced by The Stanley Works, New Britain, Conn. In fact, because they provide advanced styling and long-lasting beauty to what had always been considered "stock hardware", Stanley hinges are specified by knowledgeable architects and industrial designers the world over. The name Stanley has become a byword wherever hardware users want more than function alone.

STANLEY ADDS BEAUTY AND STYLE TO PROSAIC HARDWARE WITH THE HELP OF TEN-YEAR OLD MEAKER AUTOMATIC PLATER

To most people, a hinge is a piece of hardware on which doors or piano tops swing open and closed. Today's architects and industrial designers go beyond function alone when specifying hinges, however, for they must complement modern materials and sleek design elements.

With the help of a MEAKER AUTOMATIC PLATING MACHINE, Stanley Hardware Division produces a family of hinges with advanced styling and life-time attractive finishes, specified for distinguished buildings the world over.

According to Stanley management, their MEAKER "AUTOMATIC" has also helped expand markets by providing a variety of durable finishes unmatched by competitive manufacturers. Typical, is a new forged bronze paumelle hinge for flush interior doors, finished in beautiful satin chrome, to complement interior decor.

What's more, absolute minimum down time has been recorded since the MEAKER "AUTOMATIC" was installed *over ten years ago*. During this time, Stanley has also processed literally tons of chrome or nickel finished products of their hardware division, on their MEAKER.

To expand markets by getting the jump on competition, more and more progressive manufacturers are turning to MEAKER AUTOMATION ENGINEERS. Our catalog, WHEN TO AUTOMATE, gives valuable pointers for improving profits through automatic plating or metal finishing.

THE MEAKER COMPANY

SUBSIDIARY OF SEL-REX CORPORATION

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Factories and offices Chicago 50, Ill., Los Angeles, Cal. and Nutley 10, N. J.

SINCE MEAKER 1899

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Bench-Type Conveyors

An inexpensive, modular belt conveyor is the subject of a recently-released bulletin. The conveyor is for bench operations. The bulletin contains basic information about the conveyor and the accessories that adapt it to almost every production-assembly job. (Products for Industry, Inc.)

For free copy circle No. 1 on postcard

Describes Handbook

The American Society for Metals offers an illustrated brochure. It describes the contents of the new Metals Handbook, 8th Edition, Vol. 1, "Properties and Selection of Metals." Actual examples from each of the Handbook's six major sections are included.

For free copy circle No. 2 on postcard

Vibratory Finishers

New advances in the barrel-tumbling process are discussed in a 7-page booklet. It points out the increased process control that's possible with a new vibratory finisher. This unit couples a vibratory action with the rotary, tumbling motion of the original process. (Vibraslide, Inc.)

For free copy circle No. 3 on postcard

Corrosion-Proof Floors

Design drawings and specifications for corrosion-proof floors comprise the contents of a new literature package. It includes a guide to acid-proof cements. The folder also shows nine detailed drawings of typical floors. It describes 13 elements generally used in corrosion-proofing. (The Ceilcote Co.)

For free copy circle No. 4 on postcard

Leakproof Pumps

A low-cost line of seal-less leakproof pumps is described in a 2-page bulletin. It shows an exploded view of the unit, and reviews useful design data. (Fosteria Corp.)

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Relief-Grinding Aid

New literature describes a relief-grinding fixture. The colorful brochure shows how to use this fixture to grind any type of drill. It also discusses cam-relief grinding, grinding flutes and setups for sharpening taps. (Harris Mfg. Corp.)

For free copy circle No. 6 on postcard

Aluminum Extrusions

Answers to the 12 most-asked questions about aluminum impact extrusions are given in an engineering brochure. It covers the advantages of impact extrusions, their lubricants, preparing the slugs and other points. (Reynolds Metals Co.)

For free copy circle No. 7 on postcard

Spiral-Beval Gears

Design engineers and production men will find helpful information in a catalog dealing with stock spiral-bevel gears. It has specifications and standards for the line, and serves as a design and buying guide. (Perkins Machine and Gear Co.)

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Tracer Lathes

This circular contains a full-color illustration, complete specifications and other pertinent infor-

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FREE LITERATURE

mation about two high-precision tracer lathes. The useful data are presented in convenient outline and tabular form. (Cazeneuve Lathes, Inc.)

For free copy circle No. 9 on postcard

Industrial Controller

Photos showing a multi-point controller monitoring various machines or processes complement the text of an 8-page catalog. Specifications cover all the characteristics of the instrument, including its use with standard sensing elements. (Thermo Electric Co., Inc.)

For free copy circle No. 10 on postcard

Centrifugal Tinning

A booklet contains facts about centrifugal tinning, and specifications, descriptions and application data for a line of tinners. It illustrates the various units that are available. (The Leon J. Barrett Co.)

For free copy circle No. 11 on postcard

Leasing Pros and Cons

The fourth edition of a popular study on equipment leasing has recently been issued. Revised and expanded to 24 pages, it includes a new section that advises business executives on renewals and options-to-buy at the end of the lease period. (Foundation for Management Research)

For free copy circle No. 12 on postcard

Air Compressors

A new concept in portable air compressors is spelled out in an attractive brochure. The units use a single-stage, screw-type compressor that delivers pulsation-free air. (Gardner-Denver Co.)

For free copy circle No. 13 on postcard

Removes Fuse Adapter

Many times it's necessary for electricians to remove or change type "S" fuse adapters. A data sheet describes a new tool that does this job quickly, safely and inexpensively. (Trico Fuse Mfg. Co.)

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Fatigue-Proof Bars

The second in a series of case-study portfolios on fatigue-resistant steel bars deals with their effect on end costs in typical applications. It illustrates and dimensions each part; lists AISI grade and hardness of the steel replaced. (La Salle Steel Co.)

For free copy circle No. 15 on postcard

Recovers Waste Heat

A 24-page technical article discusses wasted-heat recovery from internal-combustion engines for fuel-cost savings. Schematic layouts illustrate many applications including utility-plant and marine installations. (J. B. Beaird Co., Inc.)

For free copy circle No. 16 on postcard

Hump Mesh-Belt Furnace

A 4-page bulletin discusses the features and advantages of a hump mesh-belt furnace for continuous bright brazing, heat treating or sintering of stainless steel. It also contains furnace dimensions, ratings and performance curves. (General Electric Co.)

For free copy circle No. 17 on postcard

Microfilm Records

A free booklet describes the operation of the engineering documents section of the U. S. Army Rocket and Guided Missile Agency (ARGMA) at Redstone Arsenal. The story details the instant mechanical retrieval of engineering drawings by film sorting equipment from a file of over 2 million drawings. (Minnesota Mining & Mfg. Co.)

For free copy circle No. 18 on postcard

Saves Weight

A reference manual, dealing with automatic weight-sensing systems, serves as an idea stimulator. It shows how the weight-sensing principle can be used to perform a wide variety of production and quality-control functions. The unit teams up a transducer with a scale to yield an electrical-readout signal. (The Exact Weight Scale Co.)

For free copy circle No. 19 on postcard

Shear Mounts

The contents of a folder on elastomeric shear mounts includes outline drawings, load deflection charts, load ranges, spring rates and parts numbers. The mounts are offered in four series that cover a wide range of applications. (Lyon Aircraft Services)

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where moisture
and abrasion
meet brightness
that never wears out
sink frames of
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At the toughest spot in the kitchen, Superior Stainless shows its metal best . . . the ever-bright, smooth gleam that asks no more than a wipe to reflect a housewife's pride. • Solid Superior stainless sink frames fabricate uniformly well because composition, dimensions and temper are uniformly as specified, every time. • We can serve you exactly as you wish. Ask us!
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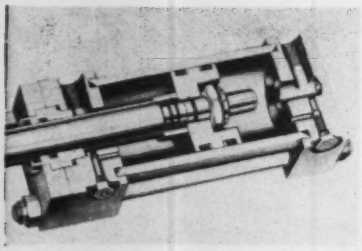
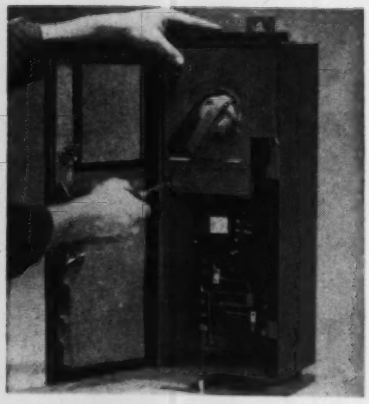
New Materials and Components



Hydraulic Cylinders Suit Low-Pressure Jobs

A new line of low-pressure cylinders cut costs where high-pressure functions aren't needed. Ranging from 1½- to 6-in. diam, they handle up to 1500 psi. A steel barrel makes them rigid. Close-fitting iron pistons promote long life. Also of note, an unusual seal arrangement automatically lubricates the bearings. For high-temperature operation, or for use with special oils, they come with Viton seals and packings. (Milwaukee Cylinder Co.)

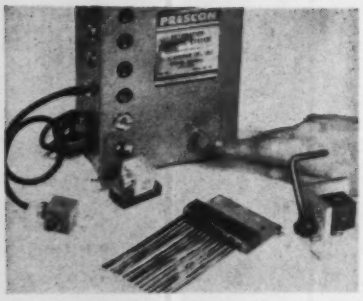
For more data circle No. 21 on postcard, p. 105



Magnetic Motor Starter Upgrades Plant Safety

Double-door, dead-front construction discourages unauthorized entry to a combination motor starter. This is a novel approach to plant safety. For normal maintenance, the main door opens with a screwdriver when the circuit breaker is in the "off" position. An additional screw must be turned to gain entrance when the breaker is on. Once the door is open, you must depress a defeater mechanism before turning the circuit breaker on. Its impossible otherwise. This protects maintenance personnel from power being accidently turned on. The new starter itself consists of magnetic motor starter, control transformer and branch-circuit protective device (either the circuit breaker or a disconnect switch.) It comes in a NEMA type-12 enclosure. (General Electric Co.)

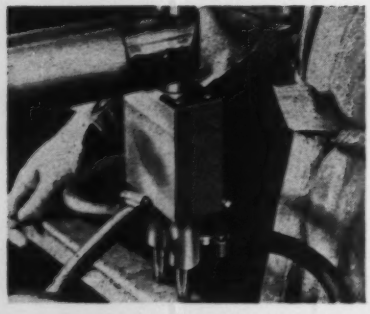
For more data circle No. 22 on postcard, p. 105



Control Shuts Off Unit, Signals Trouble Source

A new control system monitors the operation of punch presses, drill presses, wire machines, plastic-stamping, extrusion and other related equipment. By automatically protecting dies, tools and machinery, it reduces downtime. Savings in material and scrap loss also result. This automation control system detects missing parts, mislocation, stock buckling, end of stock, material and finished-part size. When a malfunction occurs, it instantly shuts down the machine and signals the source of trouble. The signal is visual or auditory, or both. (W. J. Saeman Co., Inc.)

For more data circle No. 23 on postcard, p. 105



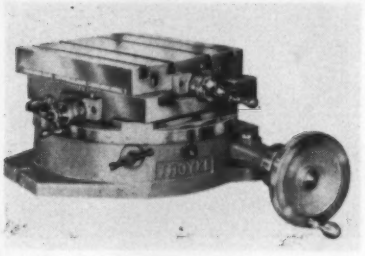
Dual Welding-Tip Holders Exert Equal Pressures

Minor variations in electrode wear or work thickness won't effect the weld when this electrode holder is on the job. It automatically exerts equal forging pressures through its two tip-holding barrels. The equalizing mechanism is purely mechanical. Therefore it provides good conductivity through its working parts. In addition the unit precisely spaces the welds and reduces welding time. The offset tips allow spacing the welds from 0-4 in. The holder comes in two models. One mounts on the welder arm. The other bolts to a press-welder platon. (Air Reduction Sales Co.)

For more data circle No. 24 on postcard, p. 105

Rotary Table

Combining a cross-slide unit and a rotary table into one rugged attachment affords precision X, Y, and rotary positioning. It has a 12 x 12-in. working surface with 10 in. of travel. Hardened and ground feed screws mount on tapered roller bearings. Accuracy is 0.001 in. in

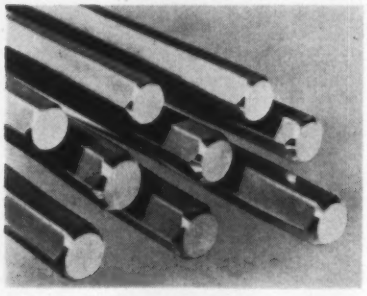


the full 10 in. of cross slide travel. Other features include ball bearings on the rotary-table wormshaft, quick disengagement of the worm, plus all surfaces precision ground. (Troyke Mfg. Co.)

For more data circle No. 25 on postcard, p. 105

Hex Brass Rod

Free-cutting brass hexagon rods with a radius corner are now available in all standard sizes. The new rods have a rounded corner design which saves weight, gives longer screw-machine life, increased rod-

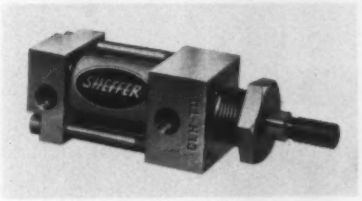


size capacity, less rod damage and an improved product appearance. Their primary use is for making brass bolts, nuts, hydraulic and automotive fittings and other parts where the hex serves as a wrenching shape. (Titan Metal Mfg. Co.)

For more data circle No. 26 on postcard, p. 105

Air-Hydraulic Cylinder

For compact machine-tool and automation applications, a stud-mounting air or hydraulic cylinder comes in double-acting or spring-return models. It's 1.625-in. square; weighs only 2 lb, in the 1-in. stroke

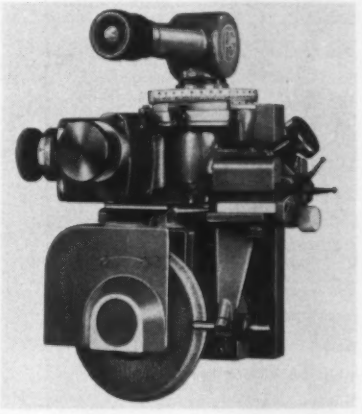


size. Piston rods are ground, polished and hard-chrome plated for wear and corrosion resistance. Four wrench flats are standard. The unit's bronze bushings are oil impregnated for good lubrication and long life. (The Sheffer Corp.)

For more data circle No. 27 on postcard, p. 105

Unit Dresses Wheels

Fast, precise dressing for grinding wheels is a reality with this new optical attachment. It mounts on



almost any standard surface or cutter-grinding machine. There's no need for templates. You don't have to make a setup between grinding and dressing, since the unit remains on the machine. It has a built-in, 10X microscope, with a radius reticle, and a 6-minute vernier for accurately setting the diamond. Optical control ends "cut and try" methods and assures a perfect transition between radii and angles. (The Parker-Hartford Corp.)

For more data circle No. 28 on postcard, p. 105

Bonds Most Materials

For a variety of materials, a general-purpose adhesive offers high-peel-strength bonds. It's strong and

THE FREEDOM DIMENSION

. . . saves 35 machining operations

This target revolver barrel is now being made by the new Hitchiner Ceramic Shell technique of investment casting. *Thirty-five* machining operations are eliminated! The only external finishing required is partial polishing.

Investment casting may provide many benefits for you . . . choice of alloy . . . flexibility of design . . . improved parts performance . . . reduction of costs. Maybe one of your parts can be made better for less.

Write for complete technical and facilities information.

HITCHINER
Milford 3, New Hampshire

CUT COSTS WITH MEEHANITE CASTINGS

You get more for your money when you order castings from a Meehanite foundry — consistent high quality, maximum economy . . . from initial cost through production, plus reliable performance in service.

Meehanite foundries are your best sources for almost every casting requirement. They offer a complete line of high strength metals, the most advanced casting methods, expert assistance, and make every effort to give you on-time delivery.

Check the list below for the Meehanite foundry nearest you.

CALL A MEEHANITE FOUNDRY FOR SERVICE

CALIFORNIA
Lincoln Foundry Corp., Los Angeles
Vulcan Foundry Co., Oakland

CANADA
Dorr-Oliver-Long, Ltd., Orillia, Ontario
Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
Otis Elevator Co., Ltd., Hamilton, Ontario

COLORADO
The Stearns-Roger Mfg. Co., Denver

GEORGIA
Georgia Iron Works, Augusta

ILLINOIS
Greenlee Foundries, Inc., Chicago

INDIANA
Casting Service Corp., LaPorte
Sonith Foundries of FMC, Indianapolis

MASSACHUSETTS
The Henry Perkins Co., Bridgewater
Standard Foundry Co., Worcester

MICHIGAN
Atlas Foundry Co., Detroit
Casting Service Corp., Bridgman
General Foundry & Mfg. Co., Flint

MISSOURI
Banner Iron Works, St. Louis

NEW YORK
American Laundry Machinery Industries Div., McGraw-Edison Company, Rochester
Pohlman Foundry Co., Buffalo

NEW JERSEY
Barnett Foundry & Machine Co., Irvington
Florence Pipe Foundry & Machine Co., Florence
Palmyra Foundry Co., Inc., Palmyra

OHIO
Centrifugally Cast Products Div., The Shenango Furnace Co., Dover
Dayton Casting Co., Dayton
Fulton Foundry & Machine Co., Cleveland
Hamilton Foundry Inc., Hamilton

OREGON
Crawford & Doherty Foundry Co., Portland

PENNSYLVANIA
Kennedy Van Saun Mfg. & Eng. Corp., Danville
Rosedale Foundry & Machine Co., Pittsburgh

TENNESSEE
Ross-Meehan Foundries, Chattanooga

TEXAS
Oil City Iron Works, Corsicana

WASHINGTON
Washington Iron Works, Seattle

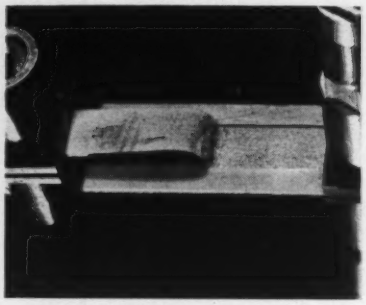
WEST VIRGINIA
Kanawha Manufacturing Co., Charleston

WISCONSIN
Love Brothers-Pyott Foundry & Machine Div., Mueller Industries, Inc., Milwaukee

MEEHANITE METAL

MEEHANITE CASTINGS ARE MADE ONLY BY MEEHANITE FOUNDRIES.

resilient; has good water resistance. The adhesive is a yellow, air-drying solution with a neoprene base. Its thin-syrup consistency lends it to brush, spray or roller-coater appli-

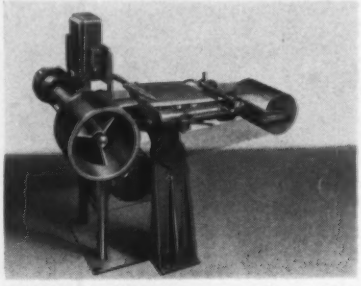


cation. Good fatigue resistance and excellent aging properties make it even more useful. (Armstrong Cork Co.)

For more data circle No. 29 on postcard, p. 105

Versatile Backstand

Designed for positive belt-tracking under heavy work pressures, a versatile backstand deburrs, surfaces, squares, grinds and polishes. A lathe wheel, or any other powered wheel, supplies the drive. The backstand boasts a special device which positively prevents belt run-offs. When heavy work pressures act to move the belt to one side or the other, it signals the idler roll which automatically corrects the



belt position. An optional platen for the working table facilitates flat grinding. (Murray-Way Corp.)

For more data circle No. 30 on postcard, p. 105

Inhibits Acid

Non-staining and odorless, a new acid inhibitor provides a thin-foam blanket to prevent acid fuming and

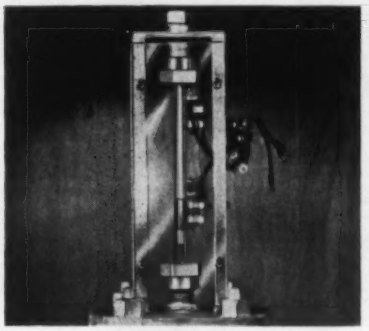
spattering. It's used with sulfuric, sulfamic, phosphoric or citric acids in metal cleaning and pickling. The

liquid inhibitor is an aliphatic compound, readily soluble in acid solutions. It won't precipitate or cloud. (Armour Industrial Chemical Co.)

For more data circle No. 31 on postcard, p. 105

Liquid-Level Gage

An indicating control, which provides an accurate visual readout of liquid level variations in refrigerant vessels, is now commercially avail-

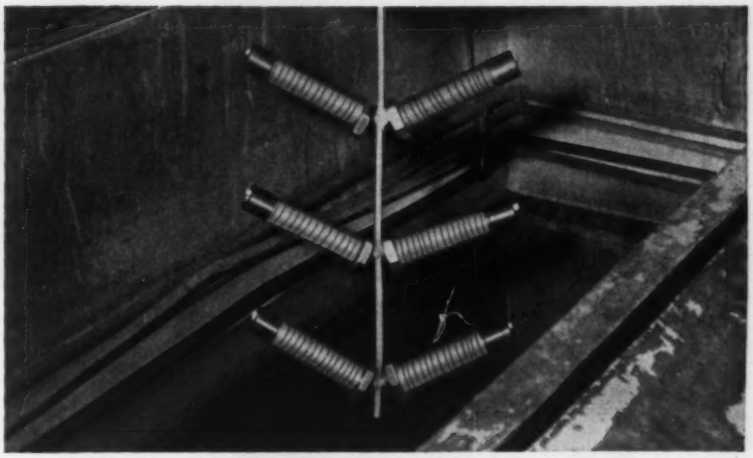


able at low cost. It's manufactured to order, with single- or multiple-control switches to provide automatic operation of pumps, valves, indicator lights, alarm bells, compressor shutdown and signal circuits. The control has only five major parts: The float chamber, guard section; control switch; combination float ball, rod and magnet-indicator; and an indicator glass. There are no moving parts. (H. H. McKinnies Co.)

For more data circle No. 32 on postcard, p. 105

Heat to Electricity

New, high-temperature, thermoelectric materials permit the direct conversion of heat into electricity, at temperatures higher than the melting point of copper. They are



mask simple shapes or complex contours

plating solutions can't creep under these tight-sticking

TAPES FROM 3M

Stop-off masking and rack wrapping are fast, easy, sure when you choose tapes from 3M for the job. "Scotch" Brand Electroplating Tape No. 470, developed especially for plating applications, is strong, conformable and has a backing that resists effects of most solutions.

Other electroplating tapes too: one that's extremely thin, tough, transparent; another backed with lead foil for use where "thieving" action is required.

TRY THIS METHOD. Ask your 3M Representative or nearest "Scotch" Brand Tape Distributor for a demonstration, or write: 3M Co., 900 Bush Ave., St. Paul 6, Minn., Dept. IBU-41.

SCOTCH BRAND
tapes for industry

Minnesota Mining and Manufacturing Company
...where research is the key to tomorrow

3M COMPANY

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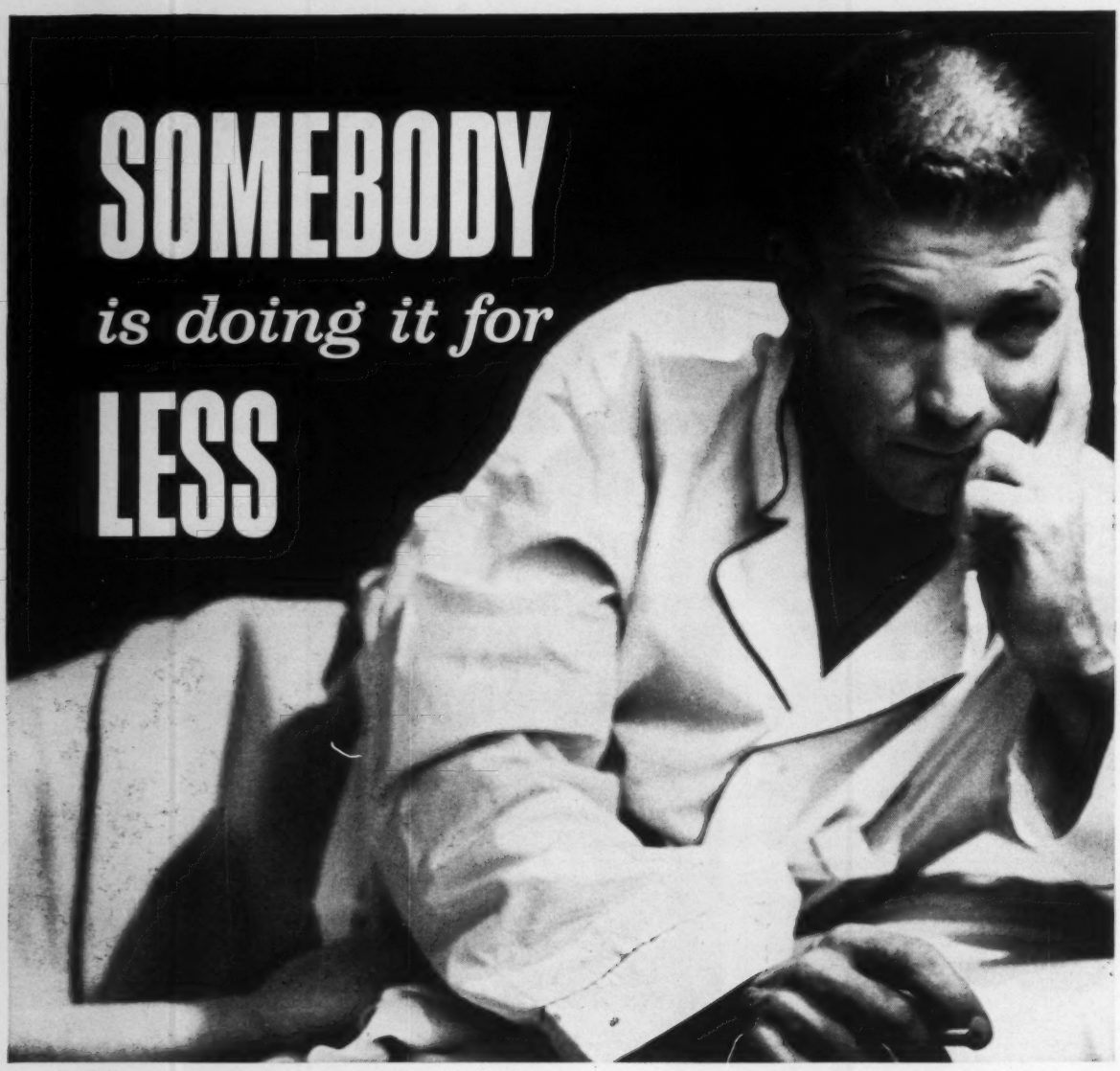
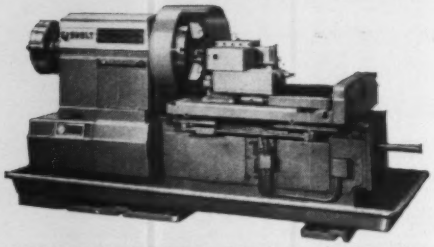
SOMEBODY *is doing it for* LESS





MASTERLINE® SIMPLIMATIC Automatic Chucking Lathe—Here's the essence of the "building block" principle: standard headstock and wide, screw-fed platen; standard front, center, rear or auxiliary slides with tool blocks—positioned to handle maximum surfaces per chucking. Add accessories to suit the work—a tailstock, boring bar speeder, single- or multiple-pass JETracer®, back-facing or back-boring attachments for simultaneous front and back machining. Literally, there's no end to *your* opportunities for saving.

Have you considered using a standard "building block" type lathe for jobs now calling for "special" machines? Others have!

Don't buy that "special" before you investigate the Gisholt Simplimatic®. You may save money and precious lead time with the flexibility this *standard* lathe offers.

Standard "building block" tooling elements combine for an infinite variety of arrangements. Operations can often be combined for reduced handling and improved quality. One man can handle multiple units. Floor-to-floor times are cut to a minimum.

Whether your "special" jobs include rings, discs, flywheels, sheaves, bevel gears, motor frames or complex housings, compare your production costs. You, too, can do it for less!

Ask your Gisholt Representative or write for Catalog 1159-C.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers® • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

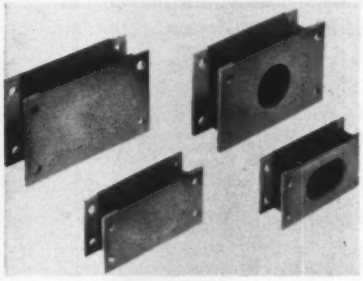
varieties of two compounds, samarium sulfide and cerium sulfide. Both are refractory materials and have excellent high - temperature

stability. In addition, thermoelectric efficiency is good at temperatures as high as 2000°F. (Westinghouse Electric Corp.)

For more data circle No. 33 on postcard, p. 105

Cushions Shock

Available for immediate delivery, new elastothermic shock mounts have a guaranteed plus or minus 10-pct spring rate. They are dimensionally designed to simplify mounting designs and tooling. The units provide semi-standardization in the selection of auxiliary mounting hardware, such as base legs, suspen-

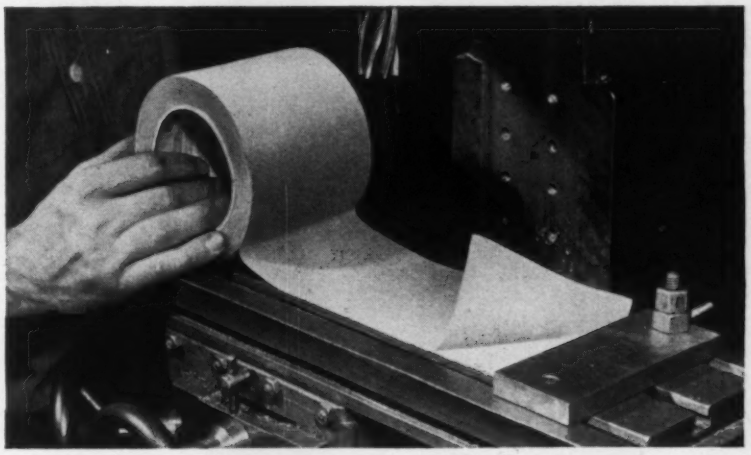


sion legs or frames. Mounts are bolted; no studs required. Cure dates are shown on the elastomer. (Lyon Aircraft Services)

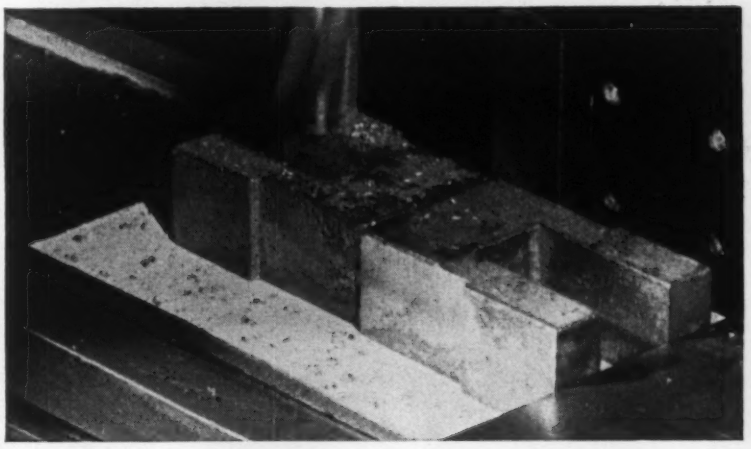
For more data circle No. 34 on postcard, p. 105

Easily-Serviced Valve

Featuring snap-in replaceable rubber liners, a butterfly valve gives bubble-tight shutoff on vacuum service and differential pressures up to



holds any metal like a magnet!



lock down nonferrous metals for milling with double-coated

TAPES FROM 3M

Keep nonferrous or small, hard-to-clamp parts where you want them during machining and finishing operations. "Scotch" Brand Double-Coated Tape goes on quickly . . . holds tight even under a flood of cutting fluid. This "tape that sticks on both sides" speeds such operations as cutting, grinding, milling and polishing.

TRY THIS METHOD. Ask your nearest "Scotch" Brand Tape Distributor to demonstrate this and the many other "Scotch" Brand Tapes for masking, surface protection, and metal finishing. Or, write: 3M Co., 900 Bush Ave., St. Paul 6, Minn. Dept. IBU-41.

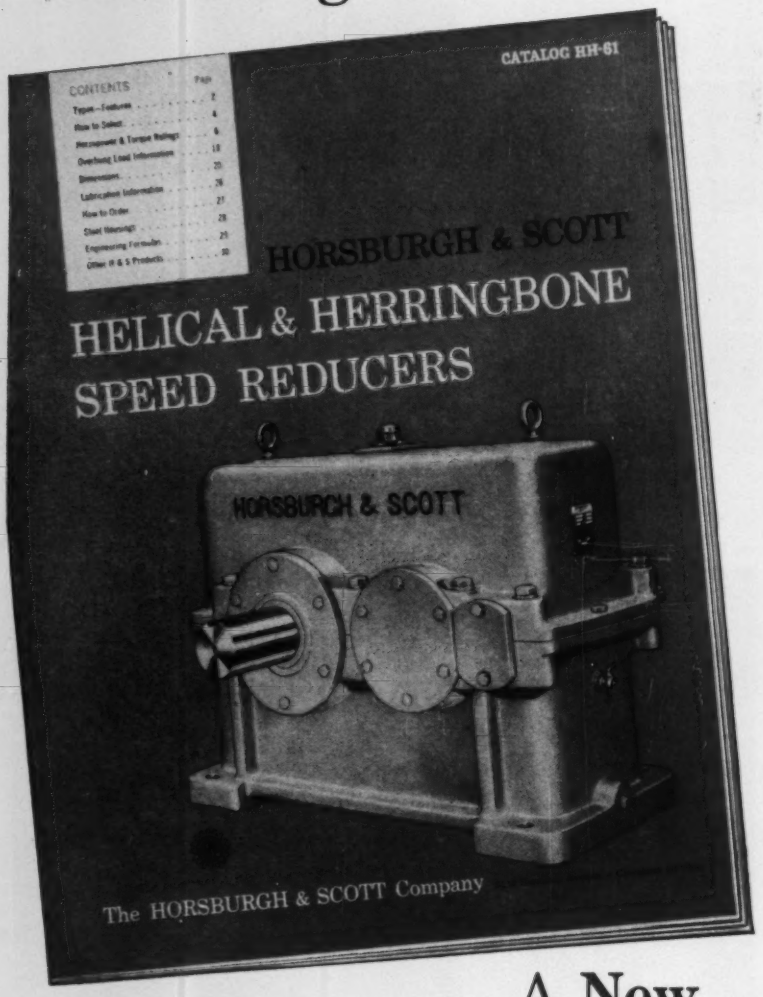
SCOTCH BRAND tapes for industry

Minnesota Mining and Manufacturing Company

. . . where research is the key to tomorrow

"Scotch" is a registered trademark of 3M Co., St. Paul 6, Minn.

Introducing . . .



. . . A New

HORSBURGH & SCOTT

SPEED REDUCER CATALOG

To Simplify Selection of Speed Reducers for Industry

New catalog features include:

New Sizes • Improved Ratings • More Ratios • Latest AGMA Thermal Ratings • Simplified Selection • Easy-to-use Overhung Load Ratings • Steel Housings.

Write for **Catalog HH-61**—on your company letterhead, please.

Let our engineering staff give you prompt assistance with your enclosed gearing requirements.

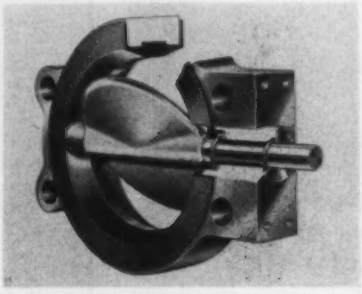
H&S

AGMA

The HORSBURGH & SCOTT Co.

5112 Hamilton Avenue • Cleveland 14, Ohio

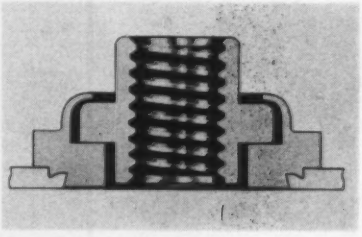
150 psi, at temperatures from —60° to +400°F. Upkeep is simple. Here's why. The valve never needs lubrication. It comes apart with a few standard hand tools. The liner replaces easily because it's held in the valve body mechanically, rather than by bonding or cementing agents. The liner also has self-aligning shaft holes, which speed re-assembly. (Continental Equipment Co., div. of Fisher Governor Co.)



For more data circle No. 35 on postcard, p. 105

Self-Locking Fastener

Clinched by a squeeze into prepared holes, this nut provides a rapidly-assembled nut anchor in sheet metal. It compensates for slight errors (up to 1/32 in.) in the alignment of mating holes. The self-locking fastener suits sheet thicknesses from 0.040 in. up, and materials with Rockwell hardness of B-70 or less. Threads are class 3B. Performance conforms to MIL-N-25,027 specification. (Penn Engineering & Mfg. Corp.)

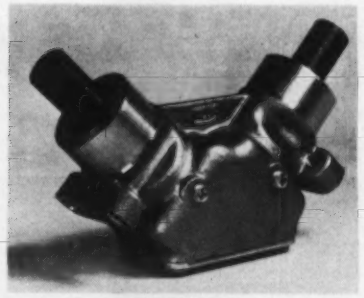


For more data circle No. 36 on postcard, p. 105

Turns the Corners

This 90° gear box is ideal for making sharp bends in rotary-type, remote-control linkages. The completely-enclosed unit consists of a

cast-bronze housing and two spindles with bevel gears supported in needle bearings. The bronze housing has tapped holes for bolting it in place. Gears are splined internally, and are pinned for lateral holding only. The gear box comes in three sizes with torque capacities from 500-3500 lb. It is about 88-pct efficient. (Stow Mfg. Co.)



For more data circle No. 37 on postcard, p. 105

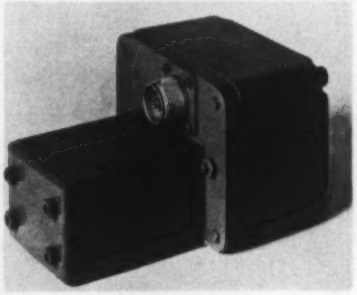
Building-Block Units

Sub-assembly units build special- and single-purpose machines; or, they modernize and complete existing machine tools. Spindle, gear, feed-table, feed-gear, adjustable-slide, round-table, bed and drill units are available from stock. (S & S Machinery Co.)

For more data circle No. 38 on postcard, p. 105

Servo Valves

Newest addition to a complete line of precision industrial servo valves is a single-stage unit. The valve rates at 3 gpm with a 350-psi pressure drop. It features simplified design with a torque motor that activates the spool directly. There are only two moving parts. The unit combines high performance (90° phase shift at 200 cps) with ruggedness and reliability. (Vickers Inc., div. of Sperry Rand Corp.)



For more data circle No. 39 on postcard, p. 105

trim the cost of trim painting!

fast and fancy finishing when you use masking

TAPES FROM 3M

The Harley-Davidson Motor Co. chooses masking tapes from 3M to speed much of the decorative trim painting on their products. Curved surfaces . . . complicated designs . . . the need for perfect results make "Scotch" Brand Masking Tapes especially desirable. These tapes from 3M conform easily . . . stick at a touch . . . remove cleanly and easily . . . leave no adhesive residue.

TRY THIS METHOD. See how it speeds finishing operations and improves results. Ask your 3M Representative or nearest "Scotch" Brand Tape Distributor for a demonstration, or write: 3M Co., 900 Bush Ave., St. Paul 6, Minn., Dept. IBU-41.

SCOTCH BRAND
tapes for industry

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. . . where research is the key to tomorrow

3M COMPANY

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McKAY DIE SHEAR LINES CUT MORE THAN STEEL. The most economical and efficient shear lines in operation today, they are being used by dozens of leading metal producers, fabricators and warehouses to slash shearing costs. Here, McKay Sales Manager Joseph F. Lyden, Jr., and M. G. Slaney, Building Division Manager, The Parkersburg (W. Va.) Rig and Reel Company — one of the nation's fastest growing manufacturers of pre-engineered metal buildings — examine panel sections cut to length by the high speed McKay Die Shear Line in the background.

This is McKay

Photo by Arnold Newman

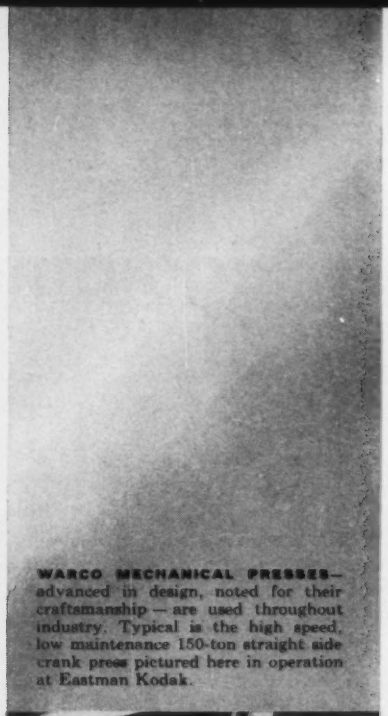
Machine....

a recognized leader in the development and manufacture of high production metal processing equipment!

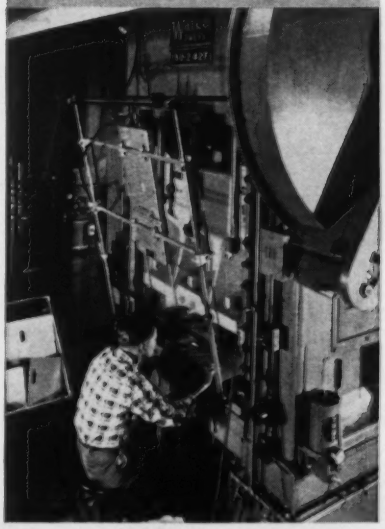
If you fabricate metals and are caught in the "profit squeeze" you'll want to know more about McKay Machine.

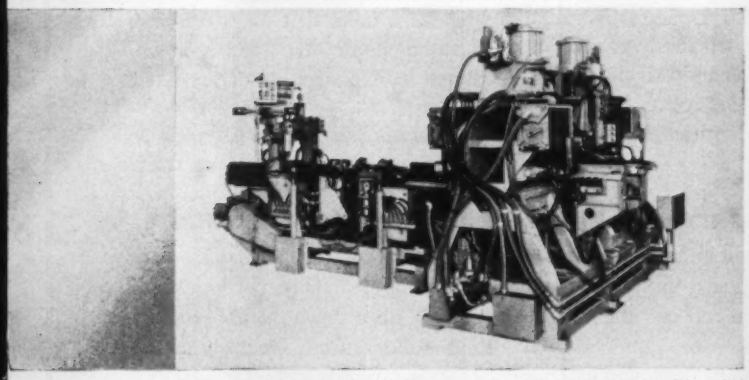
It was McKay Machine that pioneered automated integrated production lines, and it is McKay Machine that is today a leader in this field. We have conceived and produced complete lines for the manufacture of building panels, aircraft and missile sections, appliances, cabinets and components, automotive bodies and parts, and farm equipment—lines that are completely automated from *raw material to finished part or product.*

Whatever you make, if it requires metal handling, feeding, slitting, shearing, stamping, welding or forming, it's just good business to acquaint yourself with *McKay Packaged Production Lines*—high speed production equipment engineered to work in unison—with one-source responsibility from start to finish. Write for literature to *The McKay Machine Company, Youngstown 1, Ohio.*



WARCO MECHANICAL PRESSES—advanced in design, noted for their craftsmanship—are used throughout industry. Typical is the high speed, low maintenance 150-ton straight side crank press pictured here in operation at Eastman Kodak.

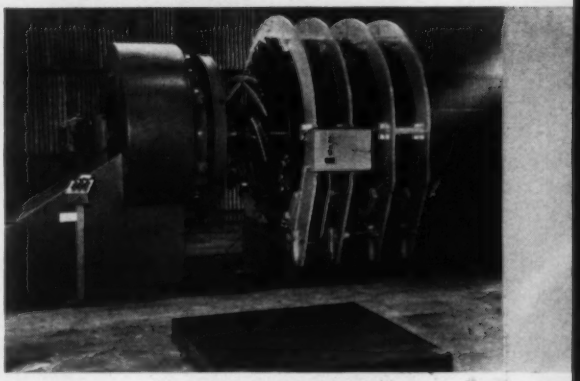




FEDERAL RESISTANCE WELDERS AND WELDING LINES, like this multi-gun combination spot and projection welder used by Hotpoint on their range production line, can be found in the plants of leading metalworking firms the nation over. Individual units, or complete resistance welding lines, are engineered to specifications by McKay's Federal-Warco Division.

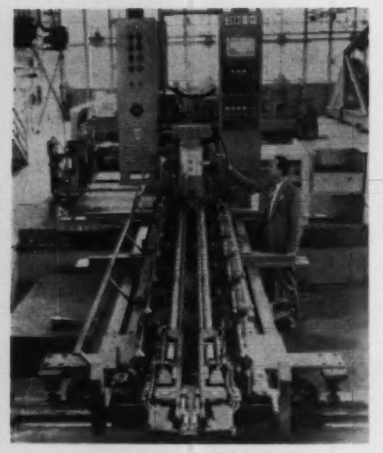
LOOK TO

McKAY McK MACHINE



BERKELEY-DAVIS AUTOMATIC ARC WELDING MACHINERY produced by Berkeley-Davis, Inc., a subsidiary, is highly popular in the aircraft, rocket, automotive and appliance industries. The rocket body welder pictured here is working at Aerojet General, subsidiary of General Tire and Rubber Company.

New Equipment and Machinery



Extended-Reach Welder Makes Blind-Spot Welds

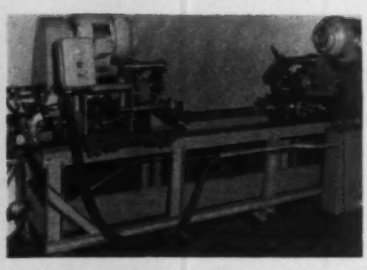
Is it possible to reach long distances, into small openings, and weld stainless-steel joints that you can't even see? The answer is yes. But it takes special equipment. For the last year, a machine has been doing just this job for an aircraft manufacturer. In effect, the welder reaches 150 in. into a 3- x 8-in. opening. Actually, the workpiece itself becomes a part of the welding machine. The reference guides are assembled in the machine's structure prior to welding. Then, a resistance welder makes successive, multiple, spot welds according to the reference-guide settings. The welding equipment, along with its support carriage, mounts on a rigid trunnion. This entire structure turns in the horizontal plane. Thus, it can weld a canted section. A hand screw teams up with accurately-guided ways to effect oblique rotation. This means even more versatility. (Sciaky Bros., Inc.)

For more data circle No. 50 on postcard, p. 105

Compact Unit Shear Forms Lighter-Gage Metals

Low in cost, this new shear-forming machine boasts all-hydraulic operation and precision results. Actually, it has two separate hydraulic systems. One of these powers an automatic tracer unit which controls the single forming roller. This roller operates best on the light-gage metals. The machine itself is a space saver—only 10-ft long, 4-ft wide and 6-ft high. It comes with an 8-speed spindle that takes off from a 15-hp motor. Or, there's an optional variable-speed drive. (The Lodge & Shipley Co.)

For more data circle No. 51 on postcard, p. 105



Machine Threads, Bores or Reams at Both Ends

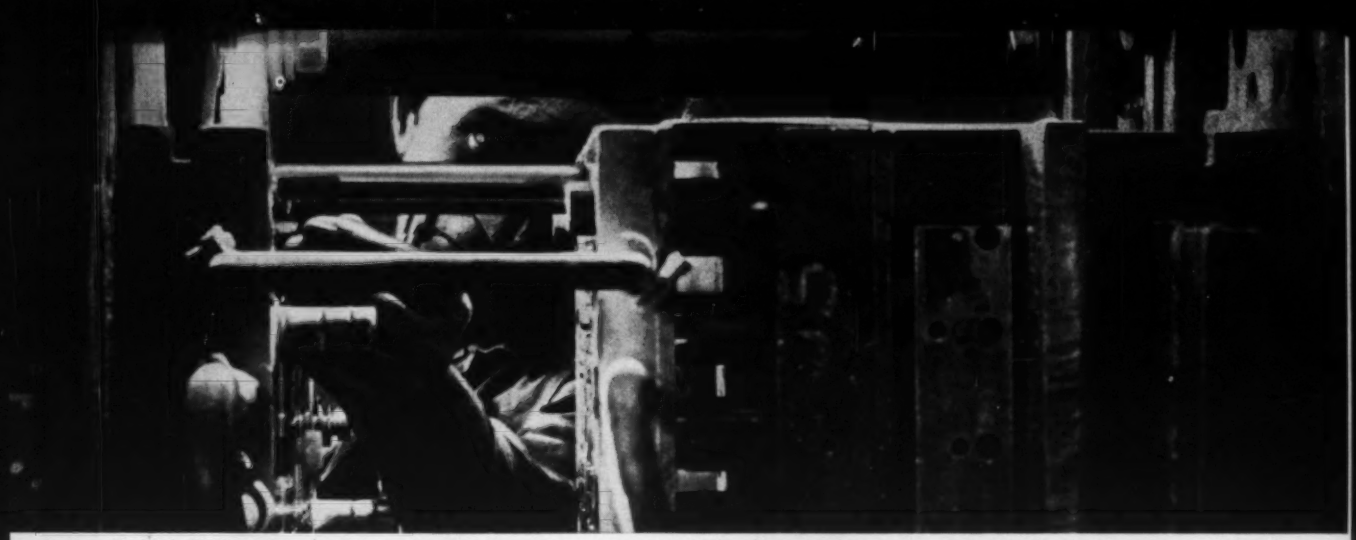
A double-end unit simultaneously machines, threads or reams both ends of a solid rod or tubing. The newcomer rolls or cuts external threads up to 4-in. long, and handles all normal boring-head operations. Both of its ends are completely independent. Each head has 3-speed feed motion. This permits rapid infeed, slow down before contact, and rapid return. One worker supervises four machines. (Automation Design & Machinery Co., Inc.)

For more data circle No. 52 on postcard, p. 105

Boring Unit Does Precise, Deep-Hole Drilling

The pictured setup drills several holes in valve sleeves. The valves are part of the servo mechanism that guides the Hawk Missile in its supersonic flight. Extreme accuracy is required. To do the job, an extremely precise machine bores holes round, within millionths of an inch. It operates at 1800 psi. Speeds range from 3000-10,000 rpm depending on the drill size. To handle these speeds, electric controls guide the table with infinitely-variable feed and traverse rates. (Pope Machinery Corp.)

For more data circle No. 53 on postcard, p. 105



Shell Tellus Oils are refined and formulated to meet exacting hydraulic service requirements, such as in this forming machine.

PHOTO COURTESY ATLANTIC PLASTICS INC., STAMFORD, CONNECTICUT

BULLETIN:

Shell provides a quick 6-point check list for hydraulic oils: Use it to pick the right oil for your needs

Selecting the proper hydraulic fluid for your equipment can be one of your most important decisions. And it can pay off in many ways. Less down time. Lower cost per unit. Longer equipment life.

Here are six bench marks to help you pick the best hydraulic oil for your plant requirements.

1. Does it have good oxidation stability? Oxidized hydraulic oil can form gums, lacquers and other deposits which may foul moving parts. Shell Tellus Oils are carefully refined to remove unstable, sludge-forming components, then fortified with a Shell-developed oxidation inhibitor.

2. Will it resist foaming and emulsification? Pump chatter and erratic operation are often the result of pump cavitation, brought on by oil foaming. Tellus® Oils contain powerful additives to help prevent foaming.

They also contain a selected inhibitor to combat effects of moisture that might be in the system.

3. Does it fight rust and corrosion? It is difficult to exclude all moisture from a hydraulic system. And moisture can form troublesome rust. Shell Tellus Oils have been carefully compounded to resist corrosion.

4. What are its lubrication qualities in continuous service? Shell Tellus Oils form a clinging, oily film on mating metal surfaces. This maintains a constant guard against wear.

5. How does it react to temperature changes? This is a key factor in the performance of hydraulic equipment. Careful selection of the proper viscosity grade of Tellus assures satisfactory operation of your system over its entire temperature range.

6. Is it available in several viscosity grades? Shell Tellus Oils are available in a broad range of viscosity grades. There's a special grade for virtually every hydraulic requirement.

Ask your Shell Industrial Products Representative for facts on Tellus Oils. Or write: Shell Oil Co., 50 West 50th St., New York 20, N. Y.

A message to manufacturers of hydraulic equipment

There is a Shell Tellus Oil suited for your equipment.

1. Your customers can get Tellus Oils at Shell depots everywhere. Readily available throughout the world.

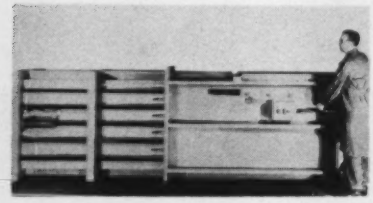
2. Quality is consistently high. Tellus always delivers top performance.

SHELL

A BULLETIN FROM SHELL
—where 1,997 scientists are working to provide better products for industry

Bales Waste Material

For use in box-manufacturing, paper-finishing and printing plants, a new baler yields a "mill-size" bale, 72 x 42 x 30 in. A paper, chipboard or boxboard bale weighs 1200 lb; a corrugated bale from 900-1000 lb. Five 13-gage baling wires contain the product bales. Here are three unusual features: Portability—no special foundation

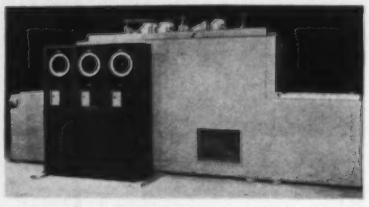


is required for installation; speed—the ram makes a complete stroke cycle in 24 seconds; safety cases enclose all moving parts. (Lake Engineering Co.)

For more data circle No. 54 on postcard, p. 105

Drawing Furnace

Push-button controls open the doors on each end of this special drawing furnace. Then, an automatic pusher advances three work baskets. One of them is pushed out of the furnace, and the pusher on the discharger end moves it out

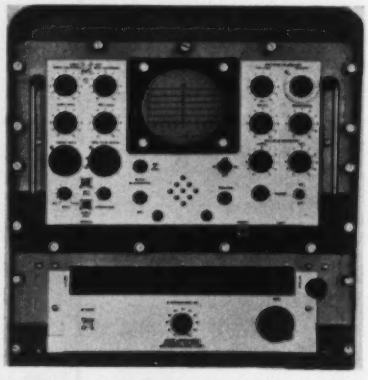


to the end of the roller conveyor. This clears the door and allows them to close. A timer signals the end of each individual heating cycle. This timer adjusts from 5-120 minutes. The electrical characteristics of the unit are as follows: 220-, 3-phase, 60-cycle, 45 kw. (Waltz Furnace Co.)

For more data circle No. 55 on postcard, p. 105

Spectrum Analyzer

Featuring a wide frequency range (10-1180 mc) plus very narrow resolution, an analyzer evaluates many widely-differing signals within



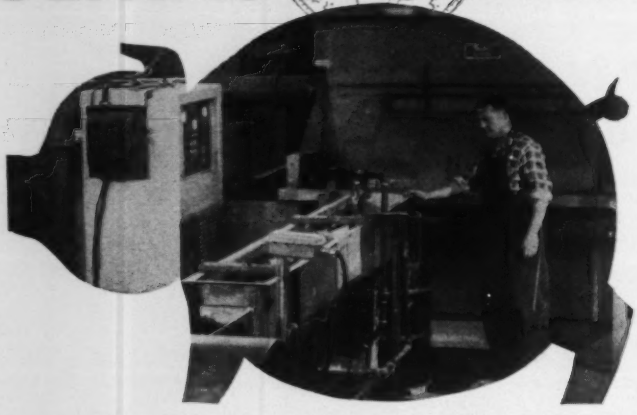
the frequency spectrum. The unit permits investigation of the spurious and harmonic content of signal sources. (Lavoie Laboratories, Inc.)

For more data circle No. 56 on postcard, p. 105

Soldering Irons

Midget soldering irons have improved performance, a new handle

HOW TO SAVE
$17,360 per year
ULTRASONICALLY



An experimental installation for removal of residual smudge from shot blasted strip by means of ultrasonics. A joint project of Pangborn Corp., Wean Engineering Co., Inc., and Branson Instruments, Inc.

The shotblast method of descaling strip is becoming more and more popular, especially among the lower tonnage producers, converters and fabricators. In this process, hot bands are descaled in a blast cabinet with abrasive shot.-Today ultrasonic cleaning is on the way to replacing flash pickling. This method, which eliminates stream pollution and acid disposal, offers many extras:

• LOW INITIAL INVESTMENT (for tanks due to inexpensive steel construction) • LOW MAINTENANCE COSTS • LOW OPERATING COSTS (in terms of heat and power input) • REDUCED OPERATING TEMPERATURES • LITTLE OR NO CORROSION • NO FUME REMOVAL • NO ACID DISPOSAL • SPACE SAVING (ultrasonic installations are shorter in length).

Branson's highly experienced, factory trained specialists stand ready to assist you anywhere in the U. S. Tell us about your particular problem and Branson's enginering department shall try to find the best possible solution in the shortest possible time.

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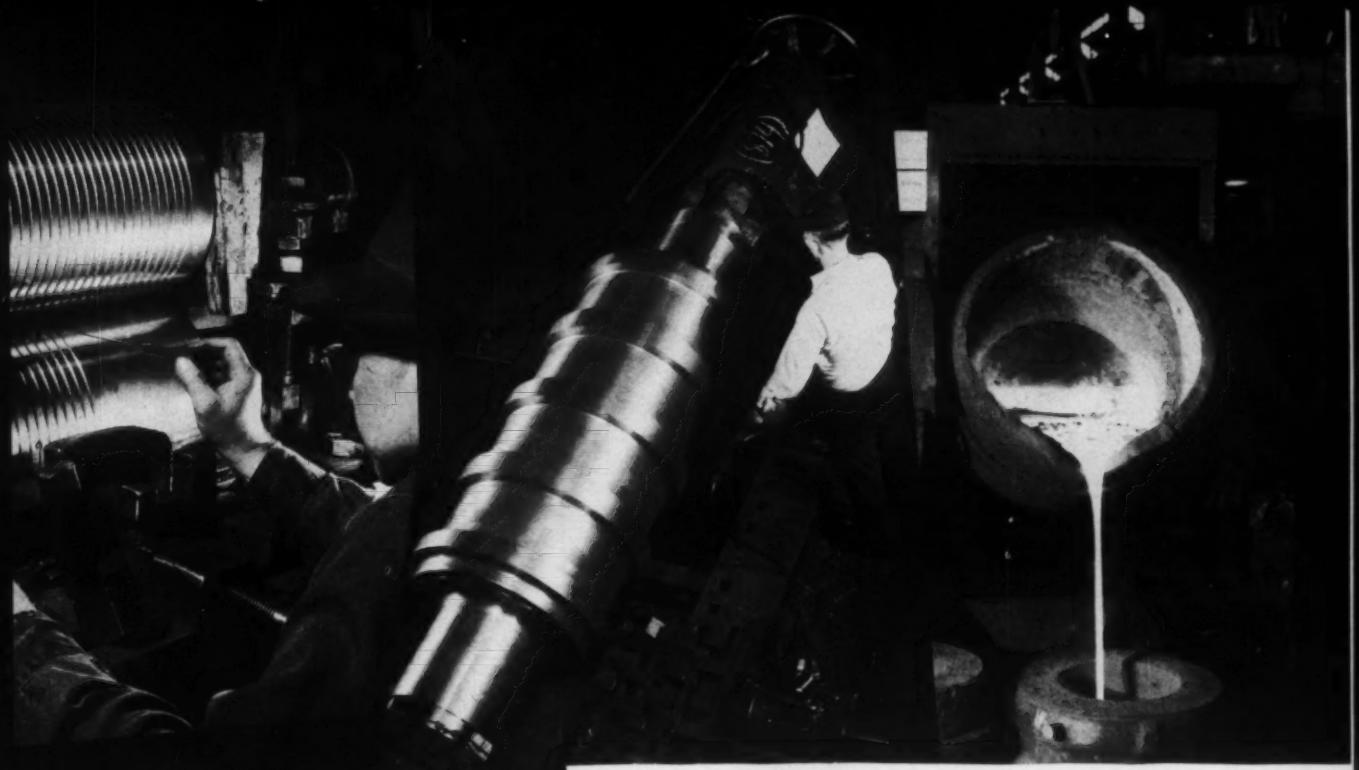

care Extra care is the vital ingredient, experience and development the guide, and maximum service the goal set for every Blaw-Knox Roll.

For more than a century, our rollmakers have worked closely with the metal rolling industry to achieve greater standards of performance and quality.

Blaw-Knox Roll Engineers welcome the opportunity to join with you in selecting and applying rolls of the proper grade and design for your operations.

Blaw-Knox Company, Foundry and Mill Machinery Division, 300 Sixth Avenue, Pittsburgh 22, Pennsylvania.

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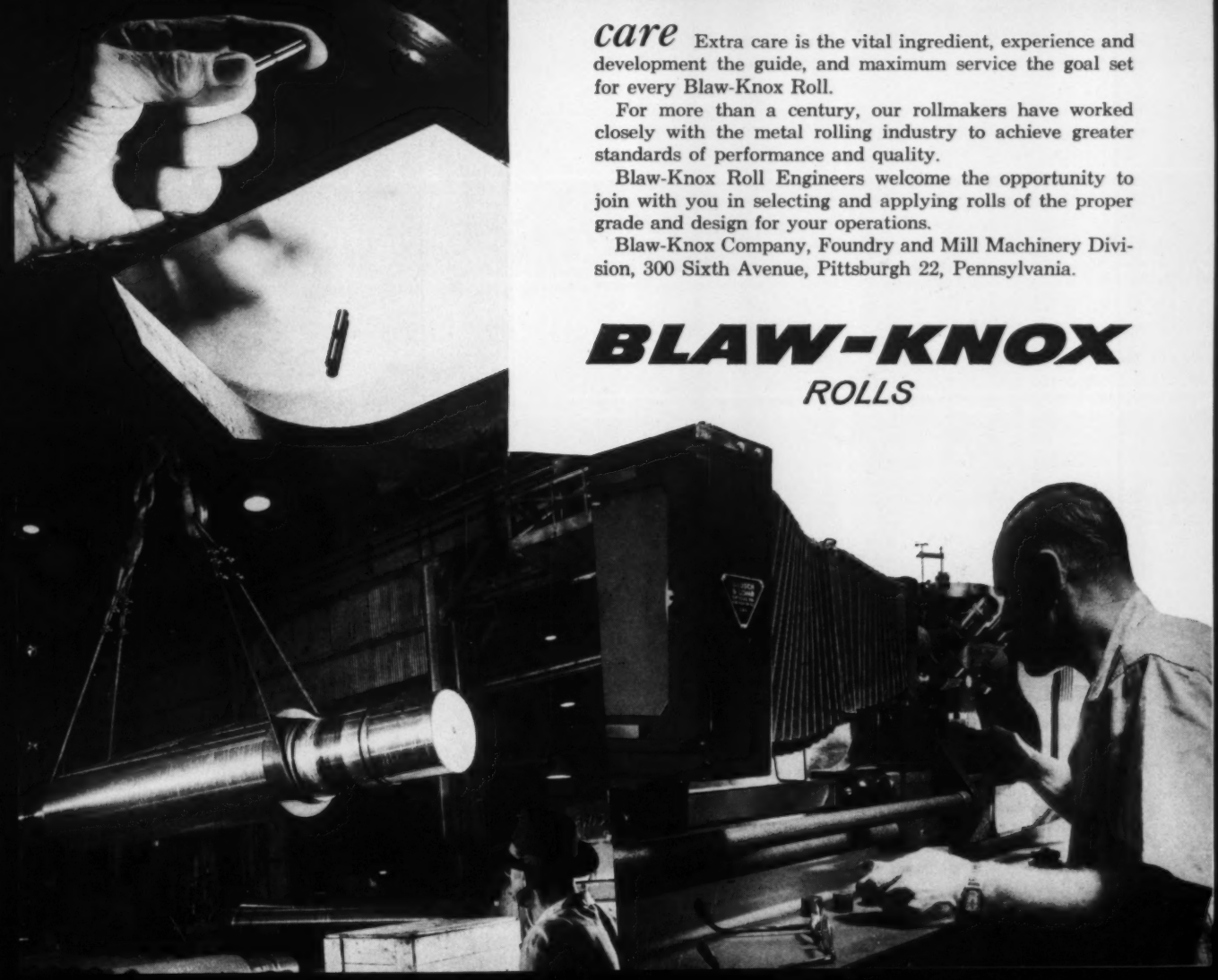
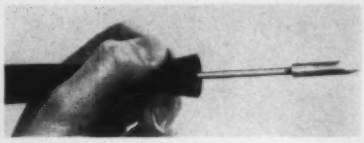
ROLLS



An important source for North American high-speed and specialty steels

ATLAS STEELS

design and redesigned tip and handle assemblies. The streamlined handle fits the operator's hand. With a new clip arrangement, the tip and heater assembles faster and easier than on previous models. The en-

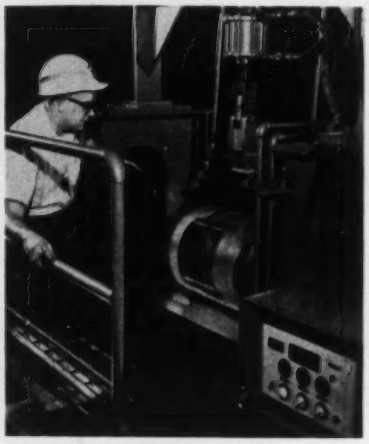


tire assembly pulls out of the handle. Then, the tip and heater assembly is slipped out and a new one put in. The units are available in ⅛- to ¼-in. tip sizes with 6-v, 18- to 35-w ratings. (General Electric Co.)

For more data circle No. 57 on postcard, p. 105

Prints on Metal Sheets

A new rotary spot printer imprints cut-to-length galvanized sheets, and other flat products. It's the only unit of its kind that controls the position, and number, of trade-marks or imprints on each sheet. Equally important, it does



this at top-line speed. The printer mounts over the galvanized-sheet conveyor line just before the piler and beyond the roller leveler. You don't need to interrupt production while it's being installed. (Jas. H. Matthews & Co.)

For more data circle No. 58 on postcard, p. 105

Sheet-Metal Tapper

Designed for light sheet-metal tapping jobs, this air-operated tapper has a pistol grip for easy hand operation. Complete with tapping chuck, it weighs only three lb. It's rugged and quiet. Convenient re-

verse and air-control buttons are a boon to the operator. Capacity of the tool is #10-5/16 in. USC or USF. Best results are obtained using two flute gun taps. (The Airetool Mfg. Co.)

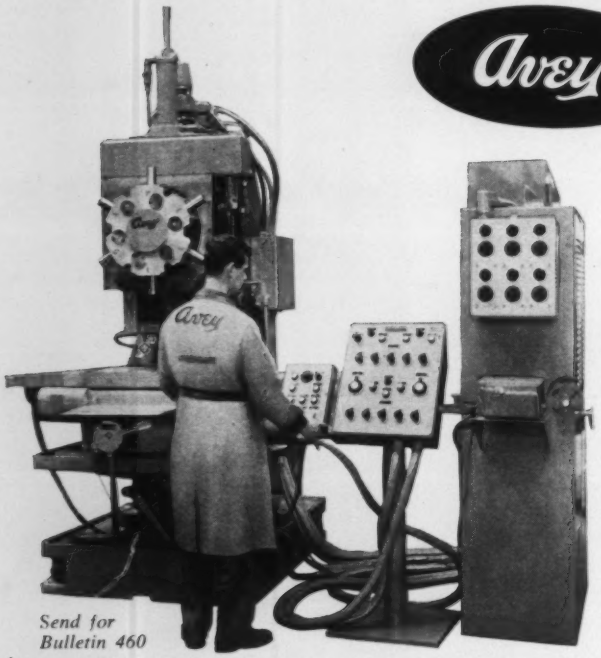
For more data circle No. 59 on postcard, p. 105

Engine Lathe

Newly designed from the ground up, this heavy-duty lathe handles all roughing, as well as finishing, in any turning, boring or facing operation. Continuous-path tape con-

6 precision spindles by

Avey



Send for Bulletin 460

You can get this rugged Avey 250 Turret-Dex with either automatic or numerical controls. Rotary, 2- or 3-axis positioning. Pre-selected speeds, feeds, rapid advance, tapping cycles. Automatic depth control all spindles; automatic turret clamp; positive spindle stop; skip index. Capacity to 1¼". Eight spindles optional. Avey, Box 1264, Cincinnati 1, Ohio.

CENTURY MOTORS PULL HEAT OUT OF 42-STORY BUILDING

Forty-two stories above Dallas, on top of the South's tallest building, three Century 50 horsepower motors are driving induced draft fans to keep the Southland Center cool.

Heat absorbed by air conditioning and refrigeration systems must be returned to the atmosphere as efficiently as possible. Increasing industrial, commercial and domestic water consumption makes it necessary to use systems which recirculate and conserve the cooling water. This cooling tower is part of such a system.

Continuous driving of three huge multi-blade fans is necessary to the operation of this three-cell tower. The Century motors are subject to all sorts of weather—heat, moisture, rain, wind, corrosion. But they keep working—continuously. Century application engineers understand such requirements—call your Century District Office or Authorized Distributor.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century

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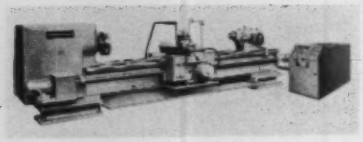
trol guarantees precision. Two speed heads, teamed up with 16:1

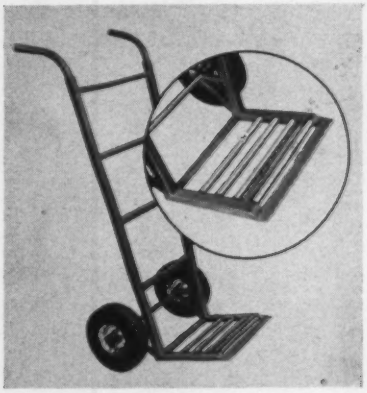


motors, give speeds of 25-1800 rpm through 30 taped changes. In all cases, the main-drive motor mounts behind the head and connects directly to the initial drive shaft. A positive-drive multiple V-belt transfers the power. (The American Tool Works Co.)

For more data circle No. 60 on postcard, p. 105

Hand Trucks

Featuring a roller-conveyor action, a new hand truck speeds loading and unloading work. It also allows closer stacking of cartons and boxes than regular hand-truck models. Each truck is made of electrically-welded steel tubes and



is fitted with high-quality ball-bearing rubber tires. (Southeastern Mfg., Inc.)

For more data circle No. 61 on postcard, p. 105

Picks Up Metal Parts

Ideal for small-parts packing, sorting and weighing, a manual magnetic unit can also feed sheets into presses and shears. It eliminates pry marks and scratches. A squeeze on the plunger-like handle

instantly releases the parts. It comes in two compact models: A light unit that handles up to 3 lb of loose parts, or larger pieces to 30 lb; a heavy-duty unit with 5- and 50-lb capacities. (Jess Corp.)

For more data circle No. 62 on postcard, p. 105

High-Blast Torch

In operation, a small amount of high-pressure air at 20-100 psi draws an equal amount of gas into the mixer of a versatile blast torch. The main venturi efficiently entrains additional combustion air and mixes it with the gas-rich high-pressure flow. This mixture goes to the

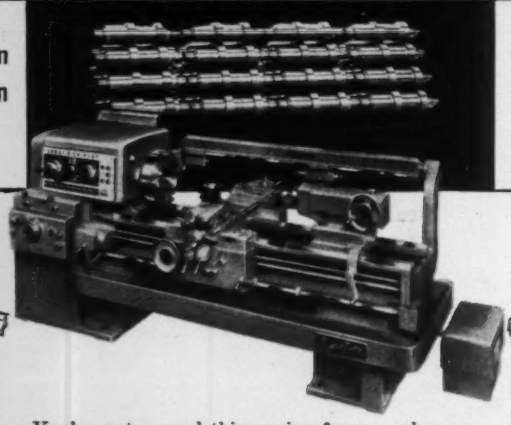
POWERTURN COPYMATIC

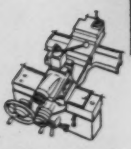
...quick-change artist!

One piece — Precision

Job lot — Quick Set-up

Production run — Minimum Cost





POWERTURN 90° COPYMATIC CARRIAGE

POWERTURN 45° COPYMATIC CARRIAGE

You've got a good thing going for you when you install a POWERTURN COPYMATIC. Choose engine lathe operation or instantly change over to tracer controlled duplication. Lodge & Shipley offers you a choice of 45° or 90° hydraulic tracing slides. No awkward projections, built for efficiency and operator convenience.

Whatever your choice, Lodge & Shipley has both. Write for literature describing each type of POWERTURN COPYMATIC... fine lathes with records such as: "saving $14,000 per year"... "production increased 300%"... "saves 85% of former time."

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your Lodge-ical choice in lathes...

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Roebling Hose Reinforcing Wire... The best things come in no-charge packages

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Roebling Hose Reinforcing Wire, used for braiding reinforcement, is produced in a complete range of sizes. Write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey, for details.

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ROEBLING

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John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation

Test salt bath neutrality quicker with a razor blade

Liquid salt baths have long been recognized for their stability, freedom from decarb and the protection they afford the surface being treated.

Regardless of the inherent stability of molten salts, however, they do occasionally become contaminated which may result in decarburization. When this happens the metallurgist can use a simple homespun method to determine the bath's neutrality.

The hard way is a metallographic check, which involves cleaning, sectioning, mounting, polishing, etching and examining a specimen under the microscope. This is costly and time-consuming.

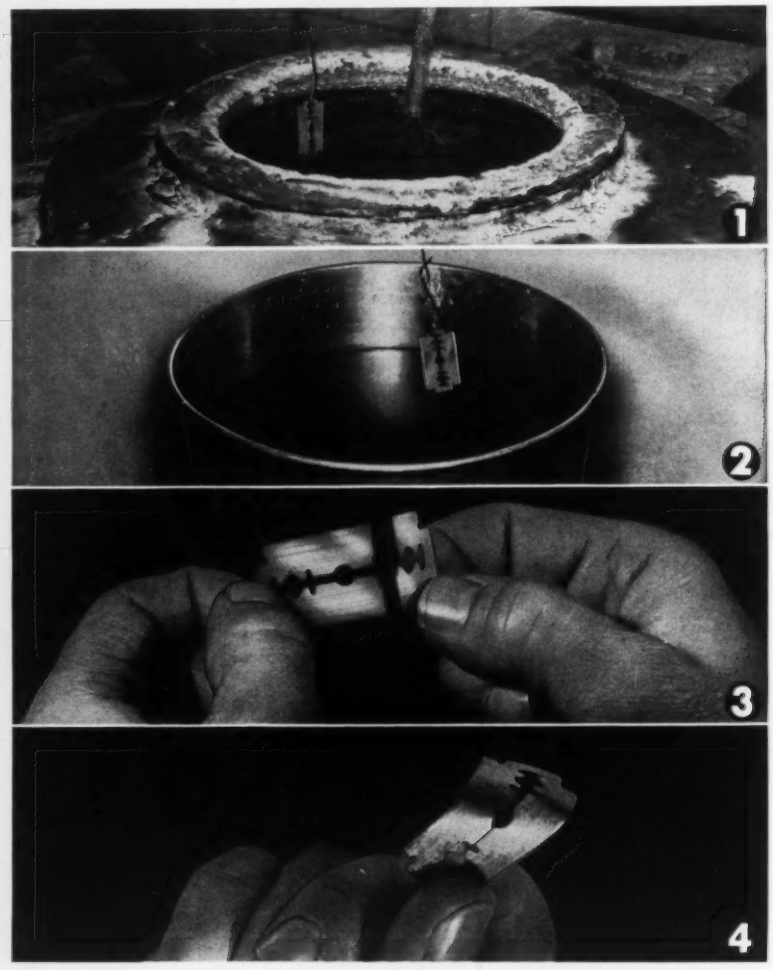
The simple way requires only an old razor blade, the double-edge type, and not one made of austenitic stainless steel. This method has been found very practical and accurate.

The blade is hung on a wire and dipped into the hardening bath of molten salt (photo no. 1), leaving it immersed for about the same time as the work being regularly heated there, and at the same temperature. Then it is quenched rapidly in water (photo no. 2).

Now for the simple bending and breaking test. Hold the blade in two hands and bend it. If it breaks with a brittle fracture (photo no. 3), the bath is neutral—no tendency to decarb. But if it bends before breaking (photo no. 4), this evidence of ductility indicates that the bath is decarburizing.

The ductility or absence of ductility indicates the condition of the salt bath. If the blade is ductile and can be bent 90° or 180° before fracturing, the steel is partially or completely decarburized. If the blade is not ductile but breaks with a brittle fracture, the bath is in good condition and work may be processed satisfactorily.

This simple test saves much time and the need for expensive metallographic equipment. It is not 100% sure, but our metallurgical friends find it very helpful for a quick and revealing test of the effect of molten salt on metal.

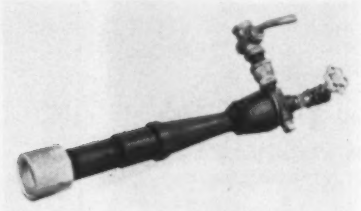


Heat treaters have come to expect the best from Houghton. And along with product purity, speedy delivery and well packaged materials "the best" includes assistance and cost-saving "hints" such as the razor blade test. Houghton makes and services salts for carburizing, hardening, annealing, tempering, quenching and nitriding. For the Salt Bath Catalog, write E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.

Houghton

INDUSTRY'S PARTNER IN PRODUCTION

burner nozzle. The torch design prevents feed back into the gas line. The unit is portable. Simply connect the air and gas lines, adjust pressure, and light up. Flame length

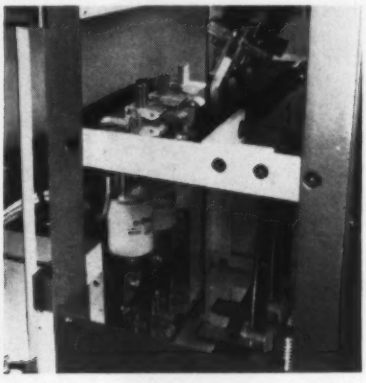


ranges from 10 in. in the smallest of eight models, to 4 ft in the largest. (Bryant Industrial Products Corp.)

For more data circle No. 63 on postcard, p. 105

Circuit Breakers

Individual enclosures promote safely on a new line of low-voltage, current-limiting units that protect against currents as high as 200,000 amp. The circuit breakers are for use in industrial plants, commercial buildings and institutions where single, wall-mounted breakers are

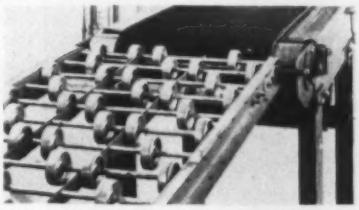


necessary. The enclosures also afford such benefits as large and accessible cable makeup area, ease of trip-unit adjustment, drawout adjustment and visible break-disconnect contacts. (I-T-E Circuit Breaker Co.)

For more data circle No. 64 on postcard, p. 105

Handles Packages

For handling packages and other flat-bottomed materials, a gravity conveyor integrates with many flow systems. The 15-in. wheel unit comes in 5-ft and 10-ft track sections. It's made of galvanized steel or heat-treated aluminum frames.



Load capacity ranges up to 1600 lb per 5-ft, steel-track section. Similar aluminum-track capacity is 1050 lb with a weight about one-half that of the steel track. (Hytrol Conveyor Co., Inc.)

For more data circle No. 65 on postcard, p. 105

Compact Lift Truck

Power steering, standard on this compact, 7000-lb lift truck, allows the operator to use its short turning radius to maneuver in minimum aisle widths. The unit handles with ease, in or out of a boxcar. It meets the demand for equipment that can

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In Alloys • Stainless • Carbon • Bronze

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ERIE BOLT & NUT CO.
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Representatives In Principal Cities

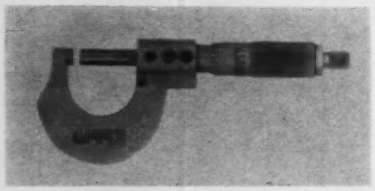
tackle large loads yet operate where space is at a premium. A special attachment allows the operator to maneuver his load into position

without moving the truck. This saves precious minutes — means more work done per shift. (Hyster Co.)

For more data circle No. 66 on postcard, p. 105

Micrometer

Protective windows magnify the digits on a low-cost, direct-read-

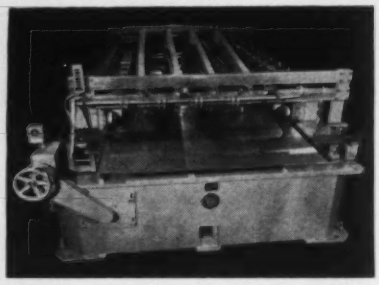


ing micrometer. Its vernier reads to tenths (0.0000). The instrument boasts a stain-chrome frame, lapped anvil and spindle faces, no spindle end play and a special adjusting nut to maintain the correct setting. (J. T. Slocomb Co.)

For more data circle No. 67 on postcard, p. 105

Roll-Forming Machine

Forming both edges in one pass, a roll-forming machine produces all-steel panels 8 to 66 in. wide. Forming speeds range from 40-120 fpm. The machine has a motor drive to the movable head. Thus,

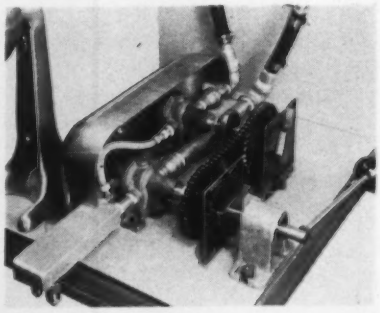


it can change its position to form 8- to 66-in. panels in 40 seconds. It comes with two sets of roller dies that produce two different types of panels. (Rockford Machine Tool Co.)

For more data circle No. 68 on postcard, p. 105

Proportions Resins

A complete production unit proportions, dispenses and mixes multi-component reactive resins such as epoxies and polyurethanes. Positive displacement pumps work through

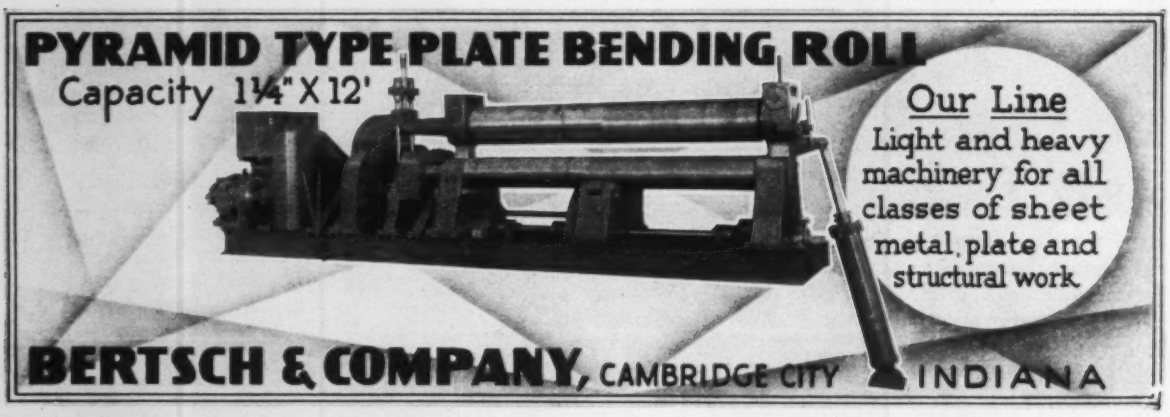


mechanical linkage to maintain proportional accuracy. A motorized mixer, with a Teflon impeller, thoroughly blends the resin mix. Short pot-life mixes are handled with ease and safety. (CPM Special Machinery Corp.)

For more data circle No. 69 on postcard, p. 105

Crown-Gear Grinder

In a recent application an external-form grinder boosted the output of crowned spherical-coupling teeth. It produces better than 8 to 10 gear units per shift. The machine uses a rocker-arm action to grind a spherical tooth (including the root) rather than a flat-tooth shape. The rocker arm controls the grinding wheel movement as it recipro-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another example . . . 'maximum protection' cargo drums from top U. S. supplier

Mahon's metal cleaning and rust-inhibiting line installed at the Port Arthur, Texas, plant of a major supplier assures a "100% scale-free" product. Complete finishing is after fabrication to provide the best in cargo drums.

Mahon's Industrial Equipment Division knows production finishing best. If you make cosmetic cases or appliances, bicycles or railroad cars, or any other metal product . . . and if quality comes first . . . call in Mahon. Improved finishing can be the easiest and most economical product improvement you'll ever make. New paints, new methods broaden the possibilities. Find out what the 'finishing touch' of Mahon can do with your products . . . your costs . . . your sales. Get in 'touch' with Mahon.

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✓ ***find deep-lying defects***
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✓ ***work out the method***
at our Industrial Applications Lab

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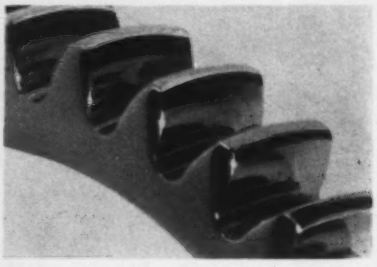
where a technical expert is always near (see 'phone book) or write

Picker X-Ray

25 So. Broadway, White Plains, N.Y.

NEW EQUIPMENT

cates through the cut. Automatic downfeed and wheel dressing not only boosts output but also increases accuracy. With this setup, spherical couplings are being held to within

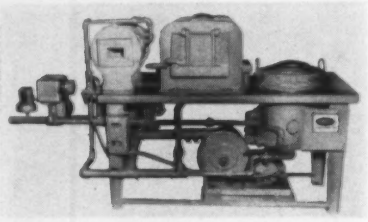


0.0004 in. on the modified involute form, tooth spacing within 0.0002 in., and spacing error between any two teeth within 0.0006 in. (Michigan Tool Co.)

For more data circle No. 70 on postcard, p. 105

Heat-Treating Furnace

For tool rooms, small shops and schools, a versatile heat-treating system consists of three units: A pot furnace, an oven and a forge. It gives gas-fired heating in five standard sizes. Practically every



heat-treating operation is possible with the new unit. It can be used for forging, welding, tool dressing, annealing, normalizing, pack carburizing and non-ferrous metal melting. (Sunbeam Equipment Co.)

For more data circle No. 71 on postcard, p. 105

Sprays Gel-Coats

Designed to spray polyester gel-coats, new spray equipment is especially useful for boats, caskets, trucks, swimming pools, concrete blocks and the like. The system consists of catalyst tank, resin tank, spray gun, respirator, and the neces-

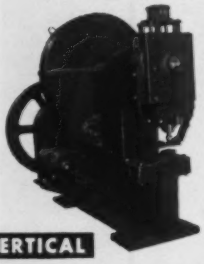
sary hoses, regulators and fittings. A single control maintains constant equal pressure on both the catalyst and resin tanks. Fixed, spray-nozzle orifices dispense the proper amount of each material under any pressure adjustment. This insures consistent quality in the finished job. (Binks Mfg. Co.)

For more data circle No. 72 on postcard, p. 105

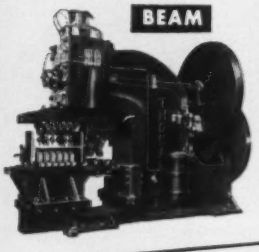
Environmental Chamber

Whether used for transistor testing, miniature-bearing manufacture, or numerous other jobs, this ½-cu

The trend is to THOMAS



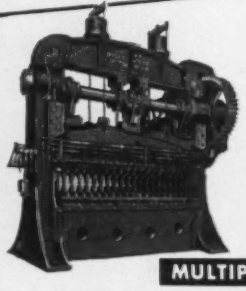
VERTICAL



BEAM

THOMAS has the punch you need

HORIZONTAL



MULTIPLE

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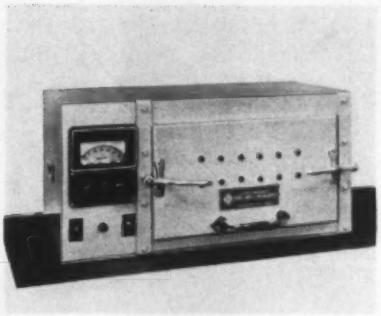
Send for bulletin on type you require
SHEARS • PRESSES • BENDERS • SPACING TABLES

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 33, PA.

62

ft chamber is practical wherever space is at a premium. The versatile chilling machine occupies less than 2½ sq ft of floor space. It's caster-mounted for easy moving. Standard low-temperature range is from −10° to −60°F. But, it is available with a high range to 500°F. The chamber is 15-in. long, 9-in. wide and 8-in. deep. Two and one-half in. of low K-factor insulation



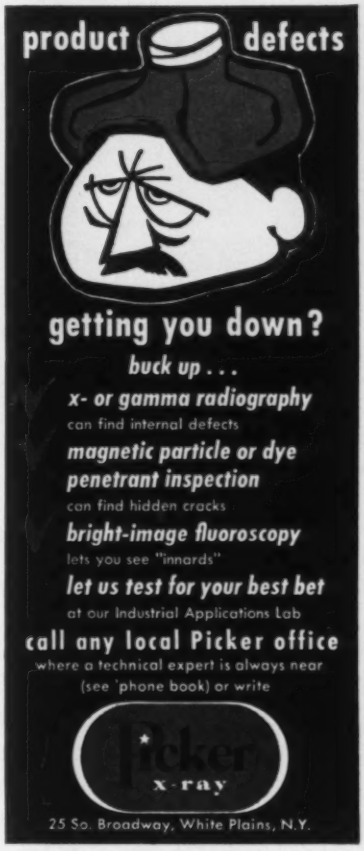
surrounds the chamber. The unit's designed for continuous, low-cost operation. (Cincinatti Sub Zero Products)

For more data circle No. 73 on postcard, p. 105

Gages Metal Strip

An amplifier, a recorder, and a pilot control, working together in this thickness gage, provide quick,

accurate measurements of metal-strip thicknesses. It amplifies electronic signals from the tracer, which moves along the strip stock under its own power. A front-panel selection dial displays the reading. In addition, the recorder provides a permanent chart record of the thickness variations. The 4-in. wide strip chart is easy to read and reproduces by conventional means. Frequent measurements on sample strip can result in huge savings. In


product defects
getting you down?
buck up . . .
x- or gamma radiography
can find internal defects
magnetic particle or dye penetrant inspection
can find hidden cracks
bright-image fluoroscopy
lets you see "innards"
let us test for your best bet
at our Industrial Applications Lab
call any local Picker office
where a technical expert is always near
(see 'phone book) or write
Picker X-ray
25 So. Broadway, White Plains, N.Y.

CONTROL

New! Space savingest relay you've ever seen: New Cutler-Hammer "Compact 300"

Cutler-Hammer's new, versatile 300 volt 6 amp., industrial control relay is so reliable it's permanently sealed. Bifurcated contacts add even more millions of operations.

So compact you can get 8 circuits in a panel space only 2" wide by 2¾" high. 2, 3, 4, 6, 8 poles with any combination of N.O. or N.C. contacts available. Add new "mechanical memory" latch at any time. Same life as relay. Get full details in PUB. LO-79-F246.

WHAT'S NEW? ASK...

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.

some cases, mill rejects have been reduced 60-70 pct. (Micrometrical Mfg. Co.)

For more data circle No. 74 on postcard, p. 105

Saws Under Water

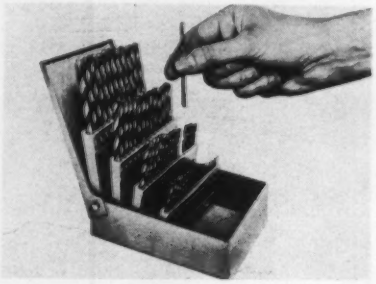
This air-powered portable saw operates safely and efficiently under all weather conditions, even under water. It saws indefinitely at maximum cutting rate without overheating or harm to the motor. Weighing

less than 14 lb, the new unit is 14-in. long and 7½-in. wide. Its standard operating speed is 6000 rpm, developed from direct motor to drive blade, with no gearing. Under normal working conditions, its air consumption is 30 cfm. (The Master Power Corp. a subsidiary of Black and Decker Mfg. Corp.)

For more data circle No. 75 on postcard, p. 105

Drill Index Case

A special feature of a new drill case is the raised numbering on both sides of each drill panel. This aids in quickly identifying drill sizes, whether the panels are lying flat in the case or standing up. The

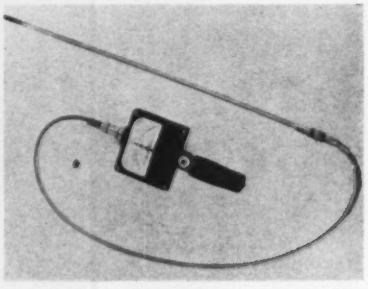


case itself serves handily as a bench stand. It puts every drill in a visible and accessible position. Drills stay clean, sharp and always ready for the next job. (Huot Mfg. Co.)

For more data circle No. 76 on postcard, p. 105

Portable Potentiometer

Electronic suppression and compensation, spans of 250°F, circuit accuracy to ½ pct, all combine to give a wide variety of accurate, easily-read ranges in this compact hand potentiometer. It does away with battery-balancing and thermo-



couple-polarity problems. Available in hand or table-top models, it's used for ovens, furnaces, salt pots and a variety of other applications. (Pyrometer Service Co.)

For more data circle No. 77 on postcard, p. 105

Stamco has a new, compact and streamlined design

...Rated 3 cuts of 3/16" mild steel.

Important advances in design and material make this unit the finest at the lowest possible cost.

Stamco is proud to announce the "All Purpose" Slitting and Coiling line. Years of engineering study have resulted in the development of this outstanding slitting equipment. These years of research are reflected in unusual features of this line.

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11955 Shaker Boulevard
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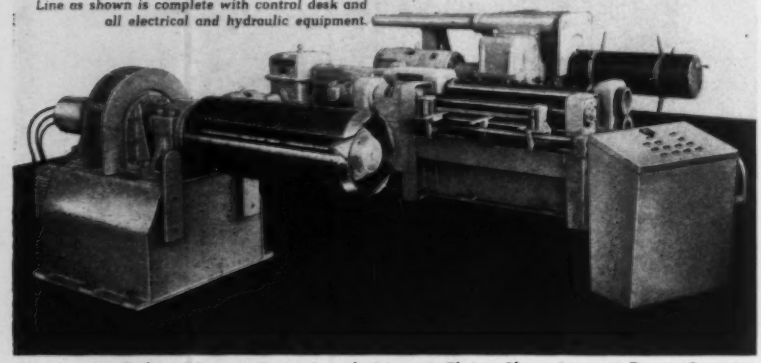
Line as shown is complete with control desk and all electrical and hydraulic equipment.



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THREE VERTICAL UNITS

IV COMBINATION FINISH FACE
TURN 2.75 DIAM.
ROUGH REAM .516

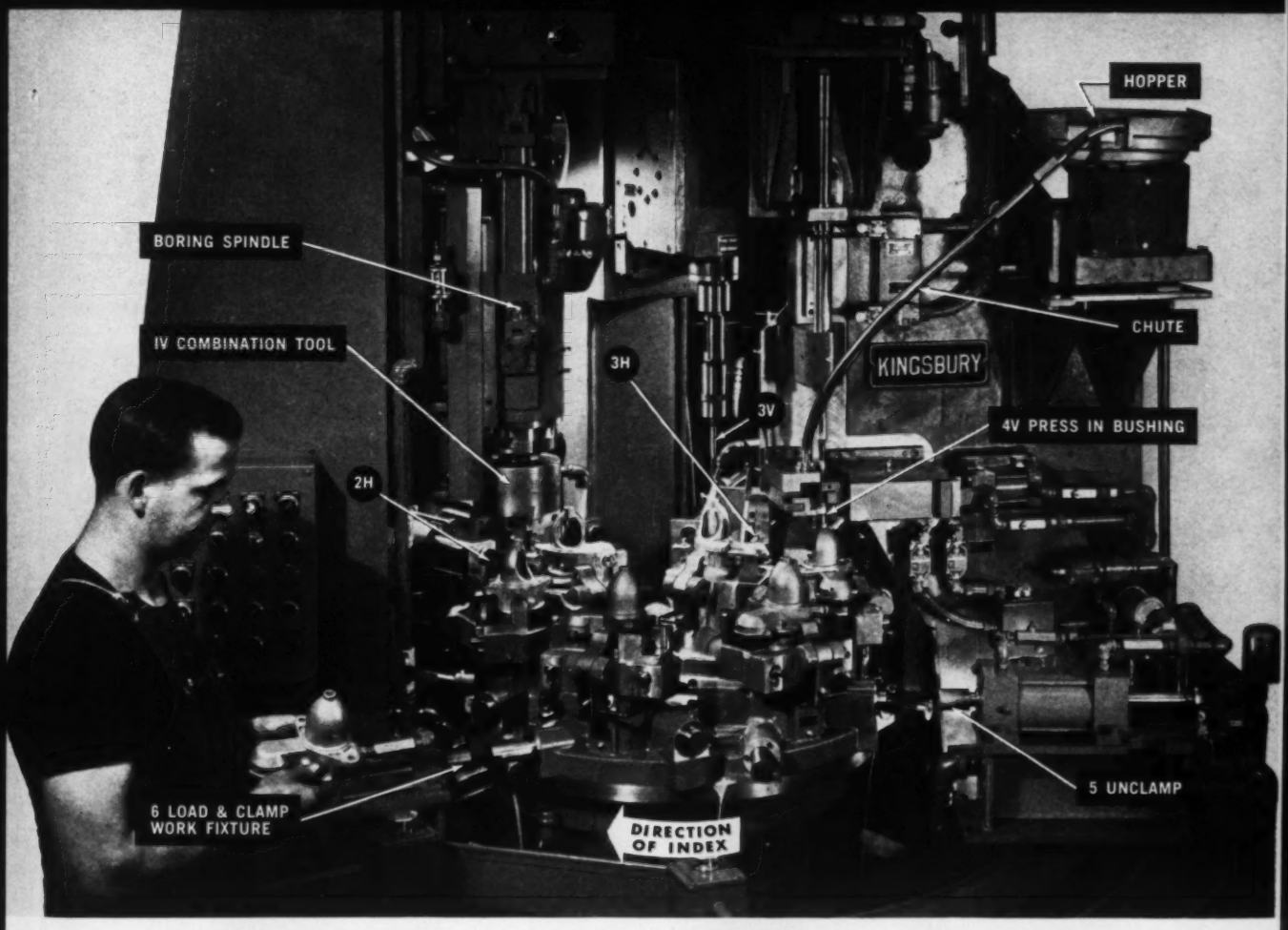
3V FINISH REAM FOR BUSHING

4V PRESS IN BUSHING
BURNISH BUSHING I.D.

TWO HORIZONTAL UNITS

2H DRILL

3H LINE REAM
THRU 2 WALLS



How versatile can a Kingsbury machine be?

This indexing automatic drills, reams, turns, faces – even presses and burnishes

Check the drawing against the photo and you'll see it's possible to combine a variety of operations in one Kingsbury. You get high production and you *don't* sacrifice accuracy.

How did we combine so many operations in a 26-inch four spindle machine with only six work fixtures?

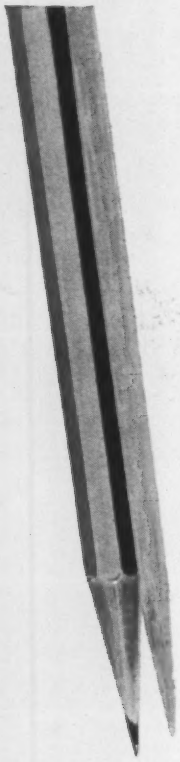
First, a special boring spindle with a large combination tool turns, finishes and faces. Slides instead of guide rods provide the rigid mounting needed for large tools working to close tolerances.

Second, the return stroke of the pin that presses in the bushing also burnishes the bushing's inside diameter.

Third, good basic design and rugged accurate construction result in the most efficient, compact setup for the job.

If you even *suspect* a Kingsbury might fit into your production, why not ask us? If we say we can do it, we can do it. Test runs before shipment guarantee each Kingsbury will produce uniform parts that gage. Kingsbury Machine Tool Corp., Keene, N. H.

KINGSBURY MULTI-UNIT AUTOMATICS



IN METALWORKING, DESIGN IS EVERYBODY'S JOB

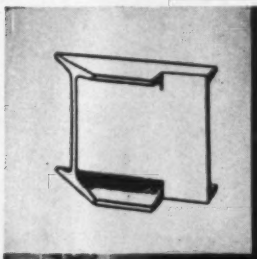
Sure, design is a primary function of certain metalworking executives. But its actual importance extends completely across the executive ranks. Decisions on styling, materials, components, and processes frequently involve top company officials and sales managers as well as engineering and production executives.

The May 11 issue of The Iron Age will go a long way toward satisfying management's need to keep up-to-date on the latest and best design ideas from a metalworking point of view. There will be features aimed at the design interests of administrative production, engineering, and purchasing personnel.

The IRON AGE DESIGN SHOW ISSUE

ISSUE—MAY 11, 1961

CLOSING—APRIL 28, 1961



COPING AND MITERING HEAVY STRUCTURAL SHAPE

18" Beam (above) is held between vises for the short cut. On the long cut (left) vises were removed and beam held by simple clamp. The MARVEL Band Saw is truly indispensable in ornamental and structural iron shops where this type of work is done daily. The machine will cut-off square, miter and cope any work shape from the smallest moulding to 18" I-beams.

SPLITTING CLAMP RINGS, BUSHINGS

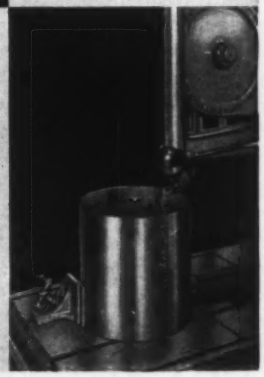
Splitting clamp rings, connecting rods, bushings and collets is a fast, simple operation on the No. 8 Band Saw. Perfect control, quick chucking facilities, accuracy and speed are features that especially fit the machine to handle this type of work.

MITERING LARGE DIAMETER PIPE

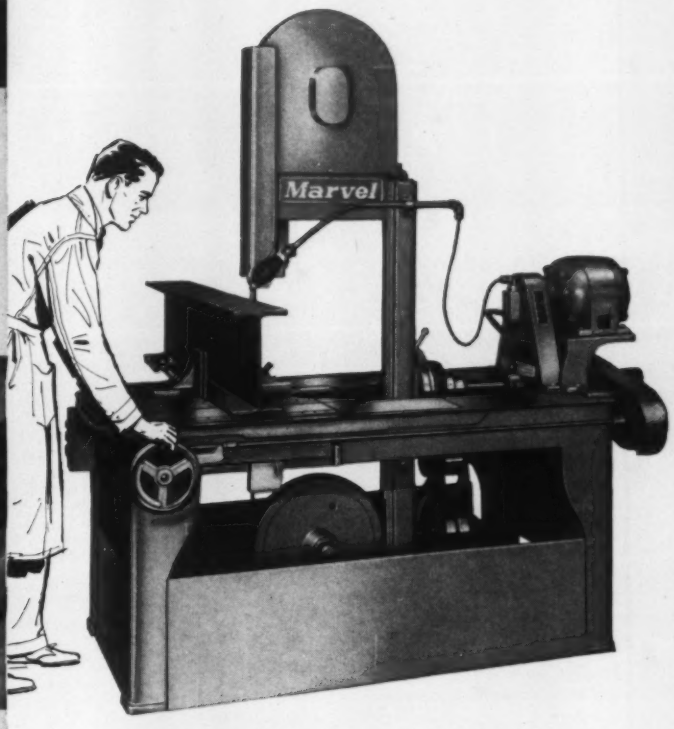
Pipe (or any bar shape) may be mitered at a 45° angle without the need for special jigs or fixtures. Even when cutting miters, work remains in the same position as it does for straight cuts. Column and blade are instantly tilted to desired angle, even without stopping the machine. Perfect miters (or lesser angles) are sawed without any layout or special equipment.

SEGMENTING LARGE DIE BLOCK

Three equally spaced re-entrant cuts were made in this 16" x 18" SAE 4130 Forging. Job was completed, floor-to-floor in 5 hours. No special jigs or fixtures were required. An unusual job that serves to emphasize the versatility of the MARVEL No. 8 Saw.



"The One Machine We Couldn't Do Without"



"As simple to use and handy as a Scout Knife" is the way another user described his MARVEL No. 8 Universal Band Saw recently . . . and we can't think of a better way to describe this versatile metal cutting machine.

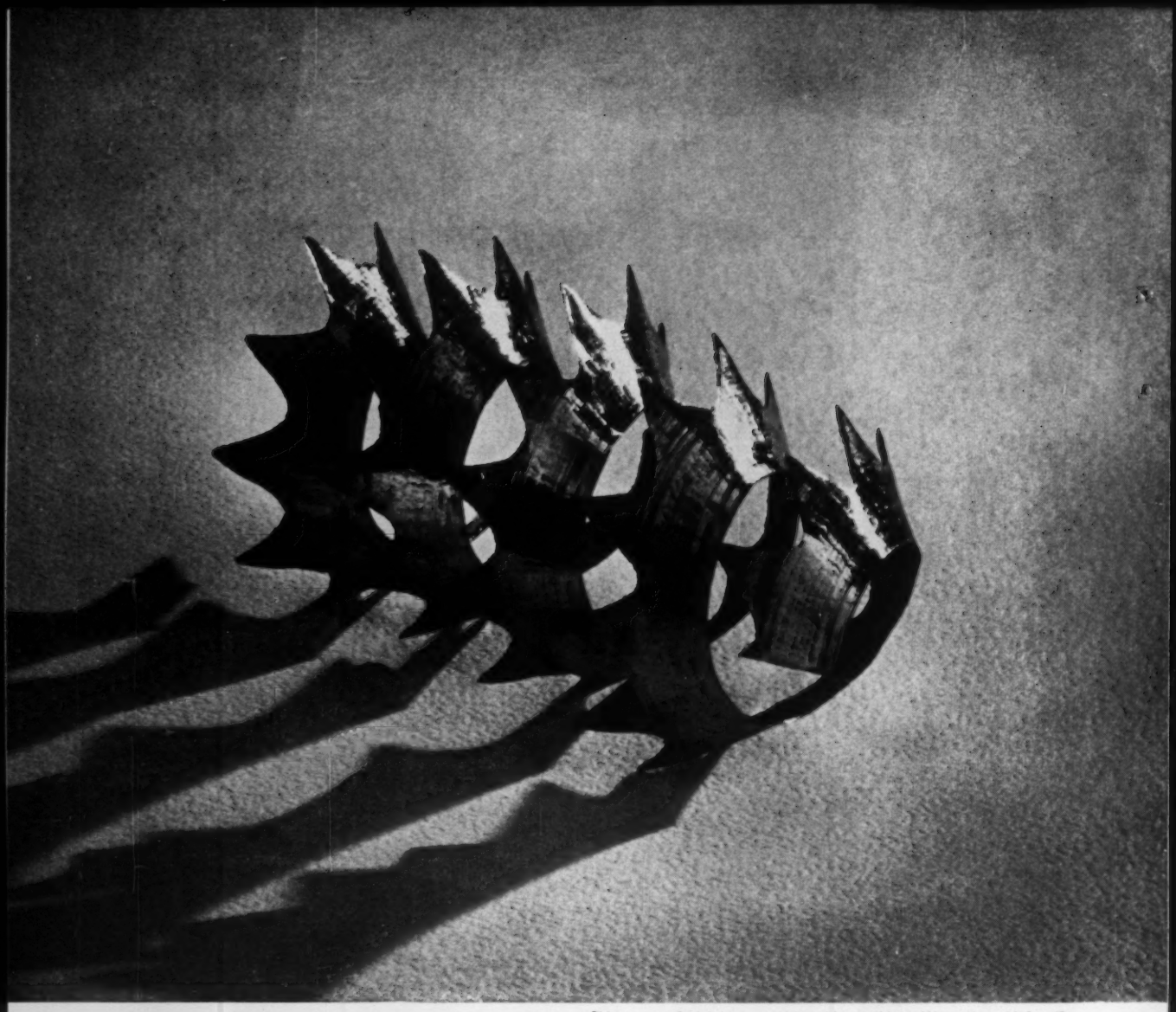
With a MARVEL No. 8 Band Saw, you can do almost any conceivable straight, angle, or miter metal sawing job—from cutting-off bar stock to making the most unusual forming cuts. You can handle small, delicate work, and in the next minute, saw structurals, or segment large work as illustrated in the lower photograph. You will save time, labor, and material with a MARVEL No. 8 Band Saw because no other saw has all the features to be had in this truly universal tool.

Upright column design and forward travel of the blade through the work (which remains stationary on the table-height saw bed) provides easy, unobstructed visibility and more convenient and efficient working conditions; column can be tilted and locked at any angle up to 45° left and right of vertical; the exclusive MARVEL Power Feed with Automatic Overload Relief; Automatic cutting-depth stops; simple, convenient operating controls—these are some of the features which make the No. 8 Band Saw the most useful—and used—metal cutting saw on the market.

For the complete story, ask or write for Bulletin 875 which illustrates and describes MARVEL Universal Metal Cutting Band Saws.

MARVEL Metal Cutting SAWS
Better Machines–Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 N. Bloomingdale Ave. • Chicago 39, Ill.



Chip – magnified 4 times – produced by machining Waspalloy with Rex 49

New Rex 49 outlasts other special purpose high speed steels better than 2 to 1

Rex 49 – a new high speed steel that can machine today's "difficult-to-cut" metals *faster and more economically* than existing special purpose high speed steels – is another in the long line of advances and improvements in specialty steels to come from Crucible research.

Crucible laboratory tests indicate that tools made of Rex 49 last as much as 4 times longer than other special purpose high speed steels . . . and it has a base price ⅓ to ½ of these steels.

Both laboratory and field reports prove the advantages of Rex 49 for machining hard, tough or abrasive metals, such as heat-treated alloy steels, stainless, titanium, and superalloys. These tests also indicate that Rex 49 has advantages in machining the more conventional metals through increased speeds, feeds and depths of cut — and Rex 49 can be hardened with conventional high speed steel heat treating equipment.

Rex 49 is indicative of Crucible's continuing leadership in the development of improved high speed and tool steels.

For more information, write: *Crucible Steel Company of America, Dept. HD06, Four Gateway Center, P. O. Box 88, Pittsburgh 30, Pa.*

CRUCIBLE STEEL COMPANY OF AMERICA

April Could Be 10 Pct Better

If a comparison of orders on the books now is valid, April could show a 10 pct increase over March.

The market is advancing in an uneven manner, but the upward movement predominates. But there's still no help from automotive.

■ Orders for steel on the books now indicate April will show a 10 pct improvement over March.

Orders on the books of major mills are from 5 to 10 pct ahead of the same period in March. Based on recent experience that late orders are now a big part of each month's tonnage, April business could improve more than 10 pct.

At 60 Pct—On the basis of unofficial percent of capacity, April production could hit 60 pct. With the upturn continuing, although slowly and in starts and stops, the second quarter should average about 63 pct of capacity.

This means that the recovery is proceeding at a slower rate than anticipated. A rate of 65 for the quarter was widely predicted earlier.

However, the reason for the slow rate is not hard to find. It lies in the hard-hit auto industry. In spite of some improvements in auto sales, the automakers are not aggressive in the steel market and are not likely to be through the second quarter.

The Prospect—It's possible that if there is a sudden spurt in auto sales, the automakers could come into the market for heavy tonnages in May and June. But as the spring sales upturn fails to meet automaker's hopes, this grows more unlikely. The next full steel buy by a typical auto plant will reflect production plans for July. In the meantime, only "fill-in" tonnages can be expected.

The improvement in the market still reflects more small orders from a wide range of customers. Tinplate and galvanized continue to lead the way in recovery of specific products.

Only Seasonal?—For this reason, many in the steel industry believe the current pickup is more seasonal than reflecting a sustained upturn in steel demand. However, seasonal influences should be in effect through the second quarter.

One development is a general lengthening of lead time. And, while there is no real attempt to rebuild inventories generally, buyers are taking out at least token insurance against shutdowns from lack of steel.

Mills are having only a little success, however, in urging their customers to buy a little farther ahead. On the other side, there are complaints from users that when they do order ahead, mills will ship in advance of the schedule. This, of course, is the very thing users are trying to avoid: Investment in inventory.

Price Cuts Here and There—But competition for the markets continues to intensify. Some price cuts in cold-rolled strip were observed in the Midwest last week and prices of some grades of stainless were also cut. In each case, those announcing the price breaks contended they were instituted to "meet the competition."

This indicates that the price front, particularly on specialty products, is on the shaky side. However, no broad movement on prices is expected at this time.

District Steel Production Index 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	100	92	89	127
Buffalo	80	77	67	134
Pittsburgh	82	80	77	121
Youngstown	65	65	63	127
Cleveland	90	89	67	157
Detroit	104	100	90	132
Chicago	96	92	93	139
Cincinnati	89	84	89	146
St. Louis	110	103	101	130
Southern	100	100	93	119
Western	107	106	108	111
U. S. Index	91.0	87.6	84.5	129.7

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	1,696	1,632	21,654	37,067
Ingot Index				
(1957-59=100)	91.0	87.6	83.0	142.1
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel, base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$39.17	$39.50	$37.83	$33.50
No. 2 bundles	$27.17	$27.50	$27.83	$23.00

Negotiated Buying Cuts Costs

"Best-of-three-bids" type of buying is not enough today. Negotiation is needed, says Louis J. DeRose in interview.

Mr. DeRose is a leading consultant in purchasing and materials management.

▪ "Negotiation of purchases is the most fertile cost reduction area in business today."

This is the view of training and management consultant, Louis J. DeRose.

Mr. DeRose feels the point of diminishing returns in manufacturing efficiencies is here. Negotiation, on the other hand, is an untried technique as far as most companies are concerned.

"And negotiation is aimed right at purchases, the biggest expenditures made in manufacturing companies," says Mr. DeRose.

Sharp Cost Cuts—Because of this combination of reasons — a fresh technique aimed at the largest expenditure area—Mr. DeRose claims that "sharp" cost reductions are possible through negotiated buying.

"And," points out the consultant, "unlike stepped up efficiencies in manufacturing that usually require investment in new equipment, use of negotiation costs nothing extra. It requires only a change in management attitude and a diversion of some personnel skills and know-how to aid the purchasing department."

Mr. DeRose reminds that there is a risk involved when a company buys facilities to reduce manufacturing costs. "Technology moves too fast today to be sure new facilities will be up-to-date and competitive when they are finally installed and operating," he says. "Negotiation involves no such risk."

Cost-Plus—Mr. DeRose sees the present economy as offering further rich savings opportunities for negotiations. He contends that free forces of supply and demand are not now working in the economy. Since the war, says Mr. DeRose, "our competitive price system of supply and demand has been steadily replaced by a cost-plus philosophy."

Mr. DeRose views this as meaning that competitive bid type of buying in many cases now is not competitive at all. This means that only negotiation, the other basic type of buying, can in many cases assure really competitive prices.

These developments have placed purchasing agents in positions of great opportunity to serve their companies, according to Mr. DeRose. And this opportunity can best be exploited when negotiations are used. One drawback has been that so many purchasing men have only a hazy or even incorrect idea of just what is negotiation.

Definition—In explaining negotiation, Mr. DeRose likes to make one point clear at the outset.

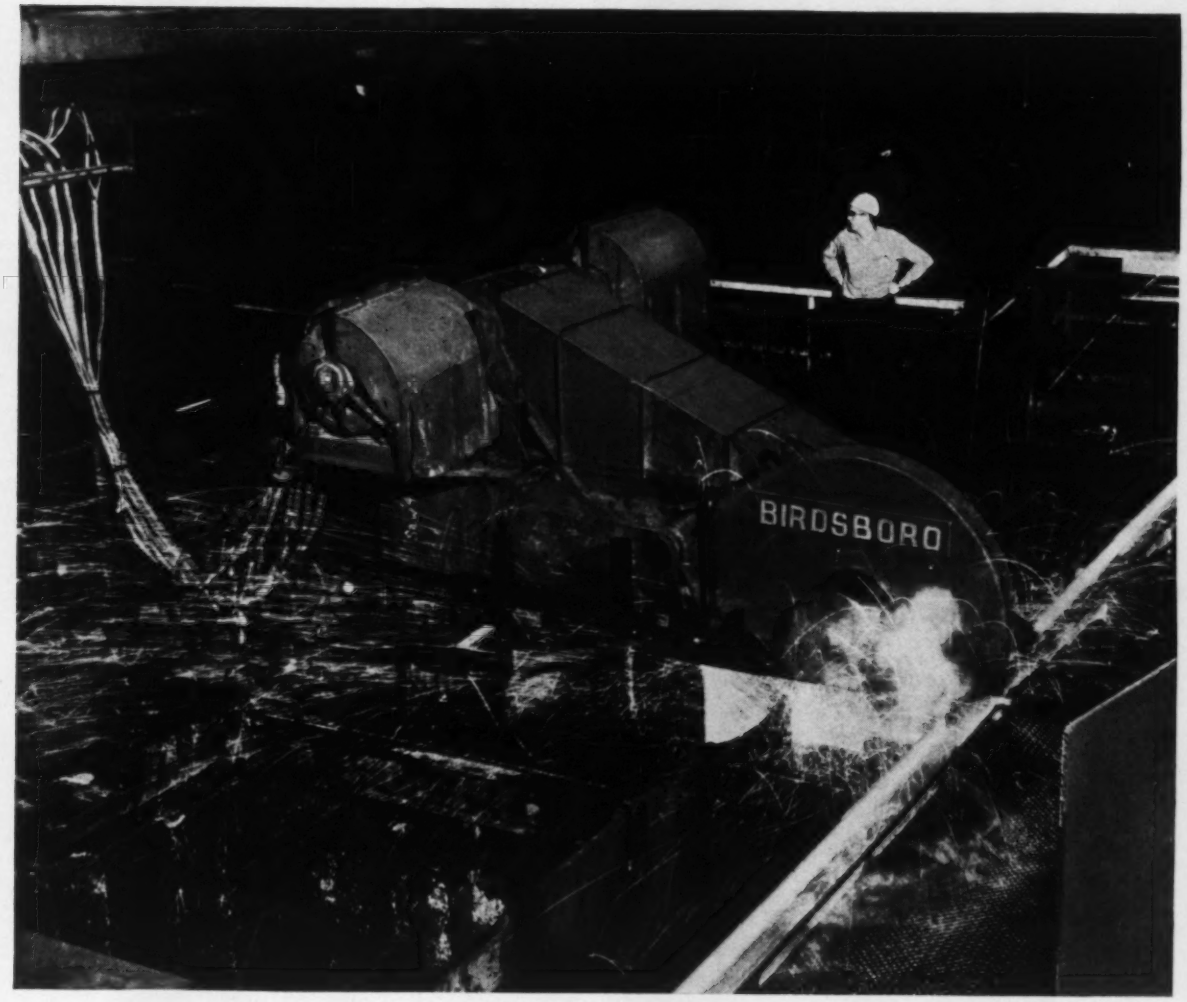
"The one thing negotiation is not, is price haggling," he emphasizes.

Mr. DeRose defines negotiation as a discussion between buyer and seller on a quote submitted by a vendor or vendors. Instead of accepting a lump bid as in the case of competitive bid buying, vendor costs elements are broken down, analyzed and discussed (negotiated). The vendor looks for a profitable transaction and the buyer looks for the best buy for his company.

"Best buy" implies more than price. Maximum value is the buyer goal. Negotiations may cover quality, incentive features, escalation, or degree of risk shared by the vendor.

LOUIS J. DEROSE: "Negotiations reduce the buying risk. . . ."

It takes only 420 seconds to change blades on this **BIRDSBORO** Hot Saw



- Dynamic braking brings the whirring blade of this Birdsboro hot saw to a complete stop in 35 seconds. Removal and replacement take 385 more. Then it's back in operation again . . . with only a fleeting production interruption for its owner, Inland Steel.

  Inland has two of these 68" Birdsboro hot saws. They are designed to cut rounds and squares, as well as wide flange beams—in lengths from 10′ to 75′, at temperatures from 1300°F to 1800°F.

  Improving engineering features like this is a specialty of Birdsboro. Our design engineers are ready to begin on *your* next job. Write: *Sales Department, Engineering Department & Mfg. Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

MM92-60

BIRDSBORO
CORPORATION BIRDSBORO, PENNA.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • ROLLS • ELECTRIC STEEL CASTINGS: Carbon, Low Alloy and STAINLESS STEEL

Stainless Prices Cut In Soft Market

Selective price reductions in specialty products are continuing. Cuts in 410 and 430 stainless are the latest.

Cold-rolled strip also has been reduced $2 a ton by three Midwest mills.

■ More selective mill base price cuts came last week—this time in some grades of stainless. And there are signs other stainless price changes may be coming.

At the same time, several Midwest mills reduced cold-rolled strip $2 a ton.

These price moves, together with earlier scattered changes in reinforcing bars, hot-rolled bar extras, tinplate, and galvanized culvert sheets and conduit, reflect the hot competition for sales.

Action by Carpenter—First action on stainless came from Carpenter Steel Co. which reduced prices on 410 and 430 cold-heading wire, a special copper-coated product. Other mills, including Allegheny Ludlum Steel Corp. and U. S. Steel Corp., met this cut. It was an 8 pct reduction in net price, depending on size and quantities of the order.

Later, effective April 10, Carpenter reduced prices on 410 stainless bars, billets, and wire. The cuts—2.5¢ a lb on forging billets, 3.5¢ on hot-rolled and cold-finished bar, and wire—are a reduction averaging 10 pct a lb. (For new prices, see p. 150.)

Competitive Move—The move was made "to recognize current competitive prices offered in the market," according to H. A. Brossman, manager of stainless steel sales for Carpenter.

Other producers say they will follow the reductions. But some are puzzled by the Carpenter action. The company is usually not an innovator in price changes. And, other mills note, while all stainless prices have been weak, the 410 grades reduced haven't been under any more pressure than others.

One mill says 410 is already a low profit item. There have been reports of foreign stainless being sold at low prices. But mills insist price cutting has been minor. Carpenter points out, however, this was an area where they encountered price cutting.

More Reductions?—Further cuts in stainless may be coming. A mill man points out 416 free machining bars, formerly costing only 0.5¢ above 410, are now four cents more. He doubts this differential will be held.

The reduction of cold-rolled strip in the Midwest wipes out a previous geographic price difference. A $2 per ton price drop was announced by Thompson Wire Co., Acme Steel Co., and Mill Strip Products Co. It brought their base prices equal with those of mills in Cleveland, Detroit, Gary, Ind. and other Midwest producing points.

PURCHASING AGENT'S CHECKLIST

How General Electric invited subcontractors to share in $300 million in defense orders. P. 62

Westinghouse acts to improve company communications on price policy. P. 63

How problems in finishing hard metals are being met. P. 77

Sheet and Strip — Flat-rolled products continue to show mild gains. Generally, greatest strength is being shown in coated products such as galvanized and tinplate. Along the **East Coast,** galvanized is the only flat-rolled product to show fresh strength. A **Pittsburgh** producer says automotive demand for sheet is a little better there. But the gain is not enough to "make anyone light up any furnaces." April orders have increased in **Cleveland,** but the help from automotive customers has been small. And, generally, it is tonnage that has just been moved up from May.

However, across-the-board demand is showing a slight pickup for May. As usual, the reports from **Detroit** are uneven. Some mills are getting a little more tonnage for April. Some of it is new; some of it is tonnage being moved up. In any case, some customers, particularly auto suppliers, may find themselves unable to get extra-fast mill delivery. Where inventories are tight, this could hurt. There is a little better tone to the flat-rolled market in **Chicago,** too.

Bars—No decisive upturn is indicated. April will likely hold the gains made in March, but not much more. **Pittsburgh** mills say that late orders could bring a slight rise, but customers are still delaying orders as long as possible. For example, about 35 pct of the orders for a month are still coming in after the start of the month. **Chicago** mills report they still have finished bar in stock.

Pipe and Tubing—Shipments of tubular products are expected to move up about 10 pct in April, according to one **Pittsburgh** producer. Only large diameter linepipe appears to be lagging. However, users are telling the mills that the problem of getting FPC approval of pipeline projects is worse than ever. One rough estimate claims the Commission's backlog is now big enough to raise the steel operating rate by 5 points if the projects were approved.

COMPARISON OF PRICES

(Effective April 10, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Apr. 10 1961	Apr. 3 1961	Mar. 13 1961	Apr. 12 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

	Apr. 10 1961	Apr. 3 1961	Mar. 13 1961	Apr. 12 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb.‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

	Apr. 10 1961	Apr. 3 1961	Mar. 13 1961	Apr. 12 1960
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$36.50	$36.50	$35.50	$34.50
No. 1 steel, Phila. area	42.50	42.50	40.50	34.50
No. 1 steel, Chicago	38.50*	39.50	37.50	31.50
No. 1 bundles, Detroit	34.50	34.50	32.50	30.50
Low phos., Youngstown	39.50*	40.50	39.50	36.50
No. 1 mach'y cast, Pittsburgh	45.50	45.50	45.50	51.50
No. 1 mach'y cast, Phila.	50.50	50.50	49.50	51.50
No. 1 mach'y cast, Chicago	50.50*	51.50	51.50	52.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$39.17*	$39.50	$37.83	$33.50
No. 2 bundles	27.17*	27.50	27.83	23.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	29.00	29.00	33.00
Copper, Lake, Conn.	29.00	29.00	29.00	33.00
Tin, Straits, N. Y.	100.50†	100.50	100.50	99.375
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Edging hot strip steel

No place for second-best equipment. That's why this heavy-duty vertical overdrive edger uses rugged Cone-Drive **double-enveloping worm** gearing to drive the vertical rolls continuously.

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CONE-DRIVE GEARS

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Market Begins Downward Move

After several months of continued strength, the scrap market has leveled. Now, a downward move may be in the wind.

Reason: Less export interest and no home support.

■ The scrap market has definitely leveled off. And now it's starting a downward move.

Reports from key areas show that export demand has eased and domestic support is still missing. With the opening of the St. Lawrence Seaway and the Great Lakes in the near future, export demand will fall off sharply on the East Coast.

Weakness is felt in New York, Philadelphia, Pittsburgh, Detroit, and Chicago this week. In fact, the Chicago market dipped for the first time in nearly ten weeks. And exporters and electric furnace buyers there are staying out of the picture with hopes of further drops.

The only continued strength this week is on the West Coast where export demand remains brisk. There are still strong rumors that major mills will enter that market in the near future.

The IRON AGE composite price for No. 1 heavy melting scrap fell to $39.17 this week on the basis of the declining Chicago price. The composite price for No. 2 bundles is down to $27.17.

Pittsburgh—The market has leveled off. Some says it's ready to move downward. Indicating the recent rise, prices on two major railroad lists were the same as last month. Predictions of a downturn are based on the fact that export commitments have been made and some tonnage has been sold at fixed prices. This is expected to bring pressure for lower buying levels. Pittsburgh would only be indirectly affected to a large extent, although reduced freight rates have now been officially proposed.

Chicago—Market drifted slightly downward with a sharp drop in volume as brokers continue to put pressure on dealer prices. Mill purchases were established at slightly lower prices, but for only small quantities. Exporters and electric furnace buyers are standing back.

Philadelphia — Export demand has subsided some and domestic interest remains nil. Scrapmen in the area are no longer optimistic about the immediate outlook. With the Great Lakes opening soon, they feel the pressure will be taken off eastern exporting. One dealer says "the next move may be downward."

New York—This market is showing slight signs of weakness. Buyer interest seems to be basically unchanged. But steelmaking grades are starting to pour into this market. It's apparently a combination of improved generation and metal that had been held up by the inclement weather. Thus far the weakness hasn't affected prices.

Detroit—The market has quieted down. There's been little activity since the middle of last week. Prices are marking time with no apparent trend downward. Foundry business is slow and Canadians still haven't made any moves. On the surface, export interest seems exhausted. But there is some feeling that exporters may be awaiting a price drop.

Cleveland—Market has reached a temporary plateau. Buyers feel they could get small tonnages for less than current levels, but any large buy would demand a higher price. Dealers are taking in only small tonnages so only small orders could be filled from the yards.

Cincinnati—Shipments are slow but steady to area mills. Out-of-town buyers are picking up bargains whenever they can. Some No. 2 bundles are going upriver. Little change is expected soon; foundries are quiet.

St. Louis—An easier tone prevails in the market here. Export demand has become soft. Some scrap is drifting in from out of the area. Mills continue to show resistance to higher prices. Scrap supplies are increasing.

Birmingham — Domestic scrap movement picked up this week with the exception of openhearth grades. An electric furnace increased its price for electric furnace bundles, but a pipe manufacturer cut the price of cast iron grades. Brokers say dealers are accepting offers now.

Buffalo—The market is quiet this week as export sales level off. Local mills may be back in the market soon. Prices are unchanged.

Boston—The market remains the same. Both export and domestic activity is fair. But there are no price changes.

West Coast—The export market is strong. Shipments to Japan continue at an active pace. There are persistent rumors that major mills will come into the market by mid-May.

Houston—Export is still brisk. But the market is leveling off with improved flow of scrap. There are more offers now, but fewer ready takers. A mill in East Texas came into the market, but the order was covered in a short time.

SCRAP PRICES *(Effective April 10, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.00 to 21.00
Low phos. punch'gs plate	44.00 to 45.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	47.00 to 48.00
Rails, 2 ft and under	51.00 to 52.00
RR specialties	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	35.00 to 36.00
Stainless	
18-8 bundles and solids	180.00 to 185.00
18-8 turnings	105.00 to 110.00
430 bundles and solids	80.00 to 85.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	38.00 to 39.00
No. 1 factory bundles	43.00 to 44.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	45.00 to 46.00
Low phos. punch'gs plate, ¼ in. and heavier	44.00 to 45.00
Low phos. 2 ft and under	41.00 to 42.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	48.00 to 49.00
Rerolling rails	59.00 to 60.00
Rails 2 ft and under	52.00 to 53.00
Angles and splice bars	46.00 to 47.00
RR steel car axles	61.00 to 62.00
RR couplers and knuckles	46.00 to 47.00
No. 1 machinery cast.	50.00 to 51.00
Cupola cast.	44.00 to 45.00
Cast iron wheels	36.00 to 37.00
Malleable	48.00 to 49.00
Stove plate	40.00 to 41.00
Steel car wheels	44.00 to 45.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	90.00 to 95.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	15.00 to 16.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	25.00 to 26.00
Low phos. 5 ft and under	45.00 to 46.00
Low phos. 2 ft punch'gs	46.00 to 48.00
Elec. furnace bundles	44.00 to 45.00
Heavy turnings	27.00 to 28.00
RR specialties	45.00 to 46.00
Rails, 18 in. and under	52.00 to 54.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	43.00 to 44.00
Malleable	48.00 to 49.00
No. 1 machinery cast.	50.00 to 51.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	38.00 to 39.00
Rails, random length	41.00 to 42.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast.	37.00 to 38.00
Heavy breakable cast.	28.00 to 29.00
Drop broken cast.	46.00 to 47.00

Youngstown

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Low phos. plate	39.00 to 40.00

Cleveland

No. 1 hvy. melting	$34.50 to $35.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	34.50 to 35.50
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	22.50 to 23.50
No. 1 busheling	34.50 to 35.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft & under	39.00 to 40.00
Low phos. punch'gs plate	35.50 to 36.50
Drop forge flashings	34.50 to 35.50
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR hvy. melting	38.50 to 39.50
Rails 2 ft and under	51.00 to 52.00
Rails 18 in. and under	53.00 to 54.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	47.00 to 48.00
No. 1 machinery cast.	47.00 to 48.00
Stove plate	41.00 to 42.00
Malleable	46.00 to 47.00
Stainless	
18-8 bundles	170.00 to 175.00
18-8 turnings	95.00 to 100.00
430 bundles	85.00 to 90.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Scrap rails, random lgth.	38.00 to 39.00
Rails 2 ft and under	48.00 to 49.00
No. 1 machinery cast.	44.00 to 45.00
No. 1 cupola cast.	38.00 to 39.00

St. Louis

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	29.00 to 30.00
Foundry steel, 2 ft	32.00 to 33.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	12.50 to 13.50
Shoveling turnings	14.50 to 15.50
Cast iron borings	21.00 to 22.00
No. 1 RR hvy. melting	37.00 to 38.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	43.00 to 44.00
RR specialties	39.00 to 40.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	33.00 to 34.00
Stove plate	33.00 to 34.00
Cast iron car wheels	35.00 to 36.00
Rerolling rails	54.00 to 55.00
Unstripped motor blocks	35.00 to 36.00

Birmingham

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	36.50 to 37.50
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	43.00 to 44.00
Structural and plate, 2 ft	42.00 to 43.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rail, random lgth.	41.00 to 42.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	43.00 to 44.00
No. 1 cupola cast.	43.00 to 44.00
Stove plate	43.00 to 44.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	32.00 to 33.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	26.00 to 27.00
No. 2 dealer bundles	20.00 to 21.00
Machine shop turnings	5.00 to 6.00
Mixed bor. and turn.	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	30.00 to 31.00
Drop forge flashings	29.00 to 30.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Heavy breakable cast.	29.00 to 30.00
Mixed cupola cast.	36.00 to 37.00
Automotive cast.	40.00 to 41.00
Stainless	
18-8 bundles and solids	155.00 to 160.00
18-8 turnings	55.00 to 60.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.50 to $30.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	4.00 to 4.50
Shoveling turnings	8.50 to 9.00
Clean cast. chem. borings	13.50 to 14.50
No. 1 machinery cast.	40.00 to 41.00
Mixed cupola cast.	32.00 to 32.50
Heavy breakable cast.	26.50 to 27.50

San Francisco

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	40.00
No. 1 dealer bundles	30.00
No. 2 bundles	25.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast.	$46.00 to 47.00

Los Angeles

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	40.00
No. 1 dealer bundles	31.00
No. 2 bundles	27.00
Machine shop turn.	15.00
Shoveling turnings	15.00
Cast iron borings	15.00
Elec. furnace 1 ft and under (foundry)	$48.00 to 50.00
No. 1 cupola cast.	45.00 to 46.00

Seattle

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	40.00
No. 2 bundles	25.00
No. 1 cupola cast.	36.00
Mixed yard cast.	31.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$31.00
No. 2 hvy. melting cut 3 ft and under	28.00
No. 1 dealer bundles	31.00
No. 2 bundles	21.00
Mixed steel scrap	23.00
Bush., new fact., prep'd	31.00
Bush., new fact., unprep'd	25.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$39.00
No. 2 hvy. melting	36.00
No. 2 bundles	28.00
Machine shop turn.	8.00
Shoveling turnings	11.00
Cut structural plate 2 ft & under	$50.00 to 51.00
Unstripped motor blocks	32.00 to 33.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	30.00 to 31.00

Kennecott Gets Union Demands

The Steelworkers union placed a long list of contract demands before Kennecott Copper Co.

There will be some serious headbumping before a pact is signed.

■ The United Steelworkers of America has placed its contract bargaining list on the table for Kennecott Copper Co. It's a long list, but how much will be bargained away is the question.

USWA represents a large number of workers in Kennecott's Utah and Arizona operations. The contracts expire July 31. The last time, USWA anchored a strike of record length at Kennecott's giant Utah plant.

Another Holiday — The union has announced it will seek a 32-hour work week with 40-hour pay. It also wants another paid holiday, and 3½ times regular pay for holiday work.

Other items on the list: Bigger premium for less desirable shifts; the company to pay all hospitalization and medical care for dependents, and for retirees for at least one year; improved pensions with a minimum of $110 per month, and eligibility after 10 years service.

The program also calls for lump payment of three months wages on retirement.

No Comments — As expected, Kennecott has no comments to make officially at this time. A spokesman points out: "They always ask for the moon. Even they don't expect to get what they ask for."

It's too early to figure which items the union intends to press for, and which are trading points. It's also too early to guess at the chances of a strike.

But there will be some serious headbumping before the new contract is signed.

Top Difference—The union has stated, "One of the major objectives of the bargaining program drafted is to bring up the wage and benefit standards of the copper workers to the same level as those paid in the steel and aluminum industry."

But a Kennecott spokesman says the company will bargain with the going rate for workers in the geographic area as its guide.

Other Factors — Here are some other factors both sides will weigh carefully:

Kennecott is the only major copper company whose contract with the steelworkers expires this year. Most others expire next year, with workers getting about 8½¢ to 11½¢ package starting this summer. Kennecott is not eager to pay more than the rest of the industry. The union has said it will fight for more.

Goldberg Role—Government intervention is unlikely until any strike has been in progress for some time. Secretary of Labor Goldberg is not likely to intervene personally because of his past affiliation with the Steelworkers.

International Union of Mine, Mill & Smelter Workers, which represents other copper companies, will have contracts expiring before the USWA's. There is no love lost between the two unions. But it's possible Mine-Mill will set the pace in copper contract settlements, putting USWA on the spot.

Aluminum

Effective March 28, Alcoa changed quantity extras for ingots as follows:

2000 to 4999 lb—new, 4 cents; old, 2 cents.

500 to 1999 lb.—new 6 cents; old, 4 cents.

Less than 500 lb—new, 10 cents; old, 6 cents.

Formerly, Alcoa had a single category from 2000 to 10,000 lb. Company says changes are minor and were made to reflect costs.

Tin Prices For the Week

April 4— 104.50; April 5 — 104.50; April 6—105.00; April 7 —105.75 April 10—106.75*

*Estimated.

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in MARCH based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd Conn. Valley	29.00
Copper, Lake	29.00
Straits, Tin, New York	103.55
Zinc, E. St. Louis	11.50
Lead, St. Louis	10.80
Aluminum ingot	26.00

Note: Quotations are on going prices

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	29.00	30.00	1/16/61
Copper (CS)	29.00	30.00	1/11/61
Copper (L)	29.00	30.00	1/16/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	150-160	182-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 145.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93 3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	.....	51.36	55.32
Brass, Yellow	48.10	48.39	48.04	52.26
Brass, Low	50.65	50.94	50.59	54.71
Brass, Red	51.54	51.83	51.48	55.60
Brass, Naval	52.86	59.17	46.67	57.02
Muntz Metal	50.94	.....	46.25	.....
Comm. Bz.	52.98	53.27	52.92	56.79
Mang. Bz.	56.80	.....	50.20	.....
Phos. Bz. 5%	54.59	74.34	75.09	76.52

Free Cutting Brass Rod 33.71

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb otherwise noted)

Antimony, American, Laredo, Tex., 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) ...$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb..... 57.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $206 to $208
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz...$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.25
- No. 120 ..... 28.50
- No. 123 ..... 27.75

80-10-10 ingot
- No. 305 ..... 33.50
- No. 315 ..... 31.25

88-10-2 ingot
- No. 210 ..... 41.25
- No. 215 ..... 38.00
- No. 245 ..... 33.25

Yellow ingot
- No. 405 ..... 25.00

Manganese bronze
- No. 421 ..... 28.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.25-24.50
- 0.60 copper max. 24.00-24.25

Piston alloys (No. 132 type)..26.00-27.00
No. 12 alum. (No. 2 grade)...22.75-23.25
108 alloy 23.25-23.75
195 alloy 25.75-26.75
13 alloy (0.60 copper max.)...24.00-24.25
AXS-679 (1 pct zinc) 23.00-24.00

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% 23.75-24.75
- Grade 2—92-95% 22.50-23.50
- Grade 3—90-92% 21.50-22.50
- Grade 4—85-90% 21.00-22.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	25	24¼
Yellow brass	19¼	17⅝
Red brass	22¼	21½
Comm. bronze	23	22¼
Mang bronze	18½	17⅜
Free cutting rod ends.	18⅜	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 26
- No. 2 copper wire 24¼
- Light copper 22
- *Refining brass 22¾
- Copper bearing material 21¾

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 26
- No. 2 copper wire 24¼
- Light copper 22
- No. 1 composition 22
- No. 1 comp. turnings 21½
- Hvy yellow brass solids 16½
- Brass pipe 14½
- Radiators 17½

Aluminum

- Mixed old cast. ..... 12½—13
- Mixed new clips ..... 14½—15
- Mixed turnings, dry ..... 13½—14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass
- No. 1 copper wire ..... 22¾—23¼
- No. 2 copper wire ..... 21¼—21⅜
- Light copper ..... 18¾—19¼
- Auto radiators (unsweated).. 13½—13⅜
- No. 1 composition ..... 17¾—18¼
- No. 1 composition turnings .. 16¾—17¼
- Cocks and faucets ..... 13¾—14¼
- Clean heavy yellow brass ... 10¾—11¼
- Brass pipe ..... 14¼—14⅜
- New soft brass clippings .... 13¾—14¼
- No. 1 brass rod turnings .... 13¾—14¼

Aluminum
- Alum. pistons and struts .... 6½— 7
- Aluminum crankcase ..... 8½— 9
- 1100 (2s) aluminum clippings 11¼—11¾
- Old sheet and utensils ..... 8½— 9
- Borings and turnings ..... 4½— 5
- Industrial castings ..... 9 — 9½
- 2020 (24s) clippings ..... 10 —10½

Zinc
- New zinc clippings ..... 5½— 5¾
- Old zinc ..... 2¾— 3
- Zinc routings ..... 1¾— 2
- Old die cast scrap ..... 1 — 1¼

Nickel and Monel
- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 23-23.50
- Clean Monel turnings 16.50-17
- Old sheet Monel 22-23
- Nickel silver clippings, mixed. 18
- Nickel silver turnings, mixed. 15

Lead
- Soft scrap lead ..... 7 — 7½
- Battery plates (dry) 2¾
- Batteries, acid free ..... 2 — 2¼

Miscellaneous
- Block tin ..... 75 —77
- No. 1 pewter ..... 57 —58
- Auto babbitt ..... 43 —44
- Mixed common babbitt ..... 9½—10
- Solder joints ..... 13½—14
- Small foundry type ..... 8½— 9
- Monotype ..... 8¾— 9¼
- Lino. and stereotype ..... 8— 8¼
- Electrotype ..... 7½— 7¾
- Hand picked type shells ..... 5¼— 5¾
- Lino. and stereo. dross ..... 1¾— 2¼
- Electro dross ..... 2 — 2½

(Effective Apr. 10, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3, B4, M10* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, City, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective Apr. 10, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Thin 0.25 lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*				$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*	Hollowware Enameling 29 ga.—7.85 *U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; 7.95 *G2* at Granite City.		
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*		6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Apr. 10, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.		5.675 *B3*									
	Fairless, Pa.	5.825 *U1*	5.825 *U1*									
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*		7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*	5.00 *A8*									8.00 *A8* 8.35 *M4*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Apr. 10, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery; Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	7.87	9.71	10.16	11.35	9.70	9.95	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.59	9.45	8.41	8.47	8.26	13.14	16.76	16.65	.....	.....
Boston	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.79	16.79	21.89	21.14
Buffalo	.15	8.70	9.45	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.85	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.90	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.69	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	11.20	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		10.17	10.98	11.35[3]	11.73	9.41	9.81	9.58	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	11.20	12.20	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.13	10.50	10.95	11.44	9.47	9.82	8.97	12.89	.....	.....	.....	.....
Milwaukee**	.15	9.51	10.49	10.99	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.24	20.49
New York	.10	9.77	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.90	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		9.45	11.30	12.35	12.40	10.55	11.00	9.45	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.27	11.79[2]	11.50	11.88	10.48	10.50	10.17	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.75	11.23	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	9.72	10.39	11.54	11.89	9.56	10.07	9.72	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—½" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16. Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅛" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Apr. 10, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	6..00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50–32.75	32.09	29.50–34.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7,* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S15,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3,* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet. *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

f.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Apr. 10, 1961)

MERCHANT WIRE PRODUCTS

	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Am'ld	Merch. Wire Galv.
F.o.b. Mill	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	.....	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.80
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***.*	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2***.*	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**.	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	...	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $290 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

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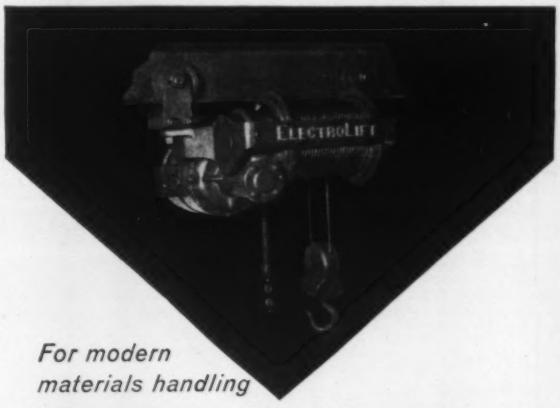

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FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 65-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	33.25
0.05% C....	34.00	1.00% C....	33.00
0.10% C....	33.75	1.50% C....	32.75
0.20% C....	33.50	2.00% C....	32.50

3-5% C, 53-63% Cr, 2.5% max. Si... 26.00
4-6% C, 58-63% Cr, 3-6% Si..... 22.50
5-8% C, 58-63% Cr, 3-6% Si..... 22.50
6-8% C, 50-56% Cr, 4-7% Si..... 22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si.. 28.75
0.025% C (Simplex) 31.50
0.010% C max, 63-66% Cr, 5-7% Si. 32.50
0.010% C max, 68-71% Cr, 2% Si max 31.50
0.25% C max 33.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	22.50	14.60
Ton lots	30.45	16.05
Less ton lots	33.40	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 13.70
Ton lots packed in bags 16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

Mn	Palmerton, Pa. 10 lb, pig	35 lb, down	Neville Is., Pa. 35 lb
16-19% ..	$98.00	$96.00	$100.50
19-21% ..	100.00	98.00	102.50
21-23% ..	102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads, bulk 34.25
Ton lots, palletized 36.25
250 to 1999 lb 39.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn ..... (Bulk)	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.

Carloads bulk 11.60
Ton lots, packed 13.25
Carloads, bulk, delivered, per lb of briquet 14.00
Briquets, packed pallets, 2000 lb up to carloads 16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe ..	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb...	2.40	3.30	4.55

(Effective Apr. 10, 1961)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y. per lb.

Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, del'd per lb con't Cb

Ton lots $3.45
Less ton lots 3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

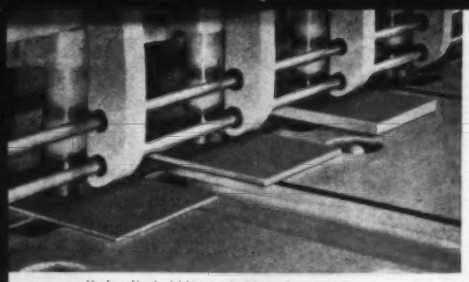
Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

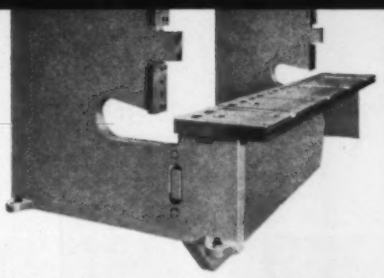
Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots (packed) $1.46
Less ton lots (packed) 1.57

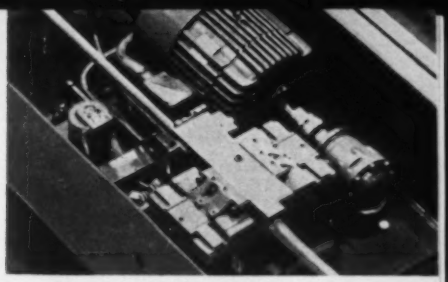
Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15



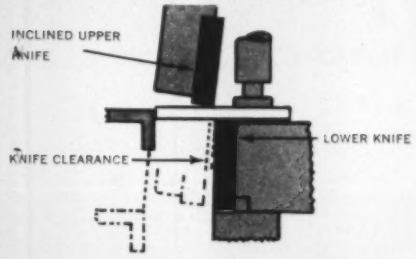
Hydraulic holddowns hold work securely.



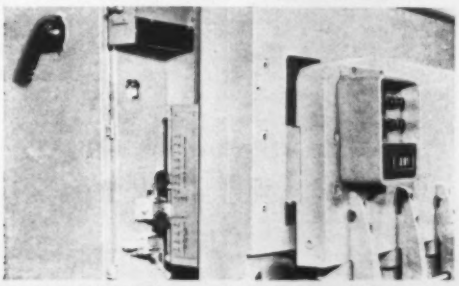
Interlocked construction eliminates load supporting welds.



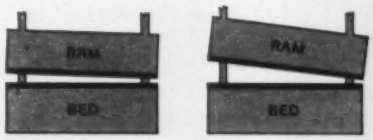
Compact manifold block replaces usual piping.



Inclined ram makes use of four edge knives practical.

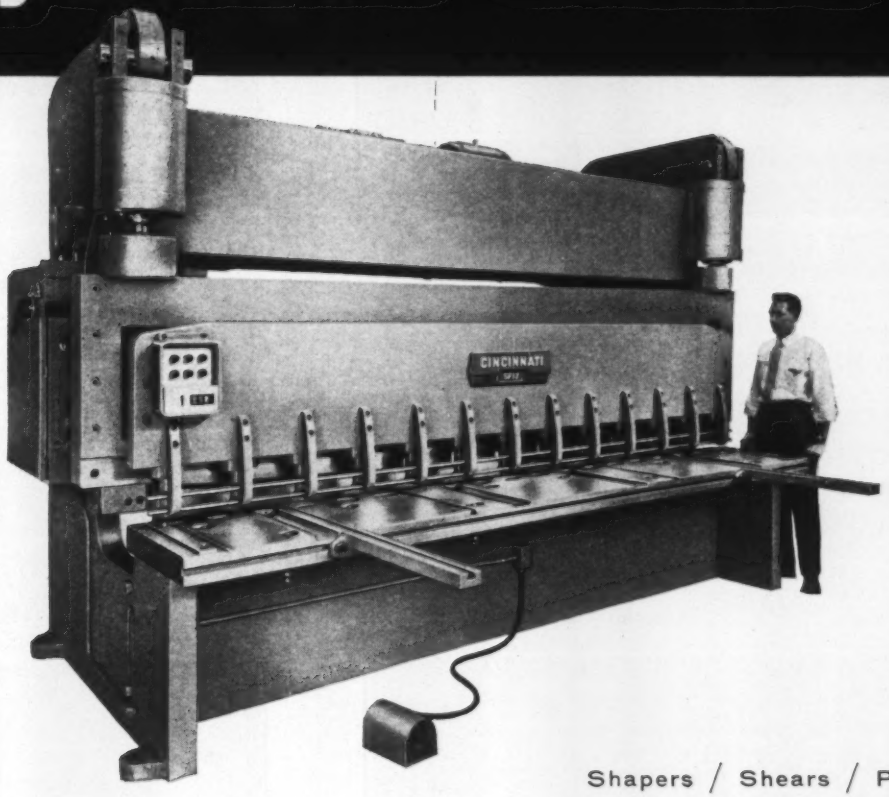


Centralized controls improve operator's productivity.



Adjustable rake gives you extra shearing capacity.

CINCINNATI®
hydraulic shears



Cincinnati Hydraulic Shears include in the standard price many features which cost extra on competitive shears. Several of these are shown above. Combined with an exceptional range of shearing capacity in one frame, they make any Cincinnati Hydraulic Shear a profitable investment. Request Bulletin HS-1 for complete details and features.

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ELECTRICAL POWER EQUIPMENT

SQUIRREL CAGE MOTORS

3 ph. 60 cy. 220 or 440 volts

(*2200 volts or higher)

HP	RPM	MAKE	VOLTS	TYPE
1500	1800	Al.-Ch.	2300	Ventilated
1250	3600	Al.-Ch.	4000	DP/PF
800	600	West.	2300	CS-44
600	600	West.	2300	CS-12
500	1800	G.E.	2300	KT-565Y
500	1200	G.E.	2300	FT-567
350	3600	Cr.-Wh.	440	SC-68
350	1200	West.	440	CS-22556H
200	900	West.	440	CS-8748
200	720	G.E.	440	KF-5648

SLIP RING MOTORS

3 ph. 60 cy. 220 or 440 volts

HP	RPM	MAKE	VOLTS	TYPE
1500	514	Al.-Ch.	2300	Mill
1000	1200	Al.-Ch.	4000	Any
1000	900	Al.-Ch.	2300	Any
600	1800	G.E.	4160	M-6345-S
500	1200	G.E.	440	M-6345-Z
500	900	G.E.	440	IM
350	1800	Al.-Ch.	2300	ARY
250	720	G.E.	4000	IM
200	720	G.E.	2300	MT-566

MOTOR GENERATOR SETS

KW	MAKE	MOTOR A.C.V.	GENERATOR D.C.V.
1750	G.E.	4160/2300	250/300
1000	West.	4160/2300	250
750	G.E.	4160/2300	250
600	G.E. (3 unit)	2300/440	125/250
500	G.E.	2300	250
400	Al.-Ch.	2300/440	125/250
250	G.E.	2300	250

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USED and RECONDITIONED

RAILWAY CARS and REPAIR PARTS

DIESEL-ELECTRIC LOCOMOTIVES

Various Sizes

* * * * * *

CRANE, Burro—5½-Ton

100-TON WHITING DROP PIT TABLE

* * * * * *

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FREIGHT CARS

Air Dump—Box—Flat—Hopper

Excellent Condition—Ready for Service

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atmosphere-controlled with 9 bases, are available. Each is approximately 7' x 7' x 14' Excellent when used for manufacture of steel coils, they have a capacity of 150 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.

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CAnal 6-2470

Slight Upswing Starts in Midwest

Used machinery dealers in the Midwest say business is finally starting to pick up slightly.

Inquiries, though scattered, are resulting in sales. Dealers themselves are taking advantage of current prices.

■ There is no real advance in used tool sales in the Midwest. A few good orders in the first week of April weren't able to dispel the memory of a dead-slow March.

But there is a growing confidence that business will pick up during the latter half of the second quarter. Yet there still is nothing concrete to hang these hopes upon.

February, it had been hoped, would bring some real sales advance. They didn't come. Optimists then began to zero in on March as the month for a general upswing. But the few gains were offset with declining sales. Now it will still take several weeks of continued gain to catch up on the poor activity of the first quarter.

Visible Effects—The continuing difficulty in sustaining profit margins is having visible effects. At lease one rebuilder has finished his backlog, closed down his shop, and is concentrating on new and used tool sales. He's out of rebuilding for good, despite several customer pleas for minor jobs.

The sideways movement of the used machinery market is also reflected in auction prices. There is no big downward trend, but it is clear that auction prices are falling off. In fact, prices have dropped to the point where some dealers are laying down equipment. Other sellers have been able to reduce their own prices by a wide margin.

Cash Sales—If there is anything to encourage dealers in the current market, it's that some customers are paying cash for used tools. Those cutomers that call usually mean business. Six weeks ago, it wasn't uncommon for the buyer to ask the dealer to "hold on" to equipment until his cash position was a little stronger.

Now the buyers come with cash-in-hand. They buy if the price is right, or shop elsewhere for a deal.

At the same time, small job shops are buying up cheaper equipment. They've confined themselves thus far to older models, lower-priced tools. This means the dealer profits are trimmed severely. Nevertheless, it does display a willingness to buy.

Other Buyers—Also, there have been some scattered orders from out-of-area buyers. At least several pieces of heavy production equipment have been recently shipped to the West Coast. And eastern buyers have also come into this area for some used tools.

One surprising development was the sale of a number of grinders and tool room lathes. The grinder sales were, for the dealer, his best volume for that tool in two years.

Optimism for the future is also revealed in the fact that some dealers have stepped up their own buying. Also, they want to take advantage of present low prices.

Whereas the normal trend is for used tool sales to lead any general business upswing, it appears this time that sales are moving with it . . . or lagging behind.

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—38" 2-HIGH BLOOMING MILL, with reversing motor, M.G.set, tables, manipulator.
1—3-HIGH PLATE MILL, 40" & 28½" x 112".
1—32" & 20" x 56" 3-HIGH SHEET MILL with motor driven screwdown and pre-set controls.
1—25" & 42" x 66" HOT STRIP MILL, 4-high.
4—29" 2-HIGH HOT SHEET MILLS, with tables.
1—16" x 28" COLD MILL, 2-high, 200 HP drive.
1—28" COLD SHEET MILL TRAIN, 6 stands, 400 HP motor and drive.
1—8" x 12" 2-HIGH COLD MILL, 50 HP motor.
1—24" 4-HIGH COLD STRIP MILL
1—24" 4-HIGH COLD STRIP MILL
1—3½" & 8½" x 5½" STRIP MILL, 4-high.
1—18" BAR MILL, 3-high, single stand.
1—9" BAR MILL, 3-high, five stands.
1—34" x 192" ROLL GRINDER.
1—STRUCTURAL STEEL BUILDING, Length 400 FT.; span 59'9", height of crane rail 40', includes 75 ton D.C. crane.
1—VERTICAL OPEN-SIDE BAR SHEAR, 28" knife, capacity 1" x 24" or equal.
2—SQUARING SHEARS for ¼" x 150" sheets.
2—SQUARING SHEARS for 10 ga. x 120" sheets.
4—LEVELERS for sheets, 17 rolls, widths 24", 42", 48", 66", ROLLS 4" DIAM.
1—AUTOMATIC SQUARING SHEAR UNIT for sheets, 162" side cut, 72" end cut.
1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 48" dia. rolls.
1—CORRUGATING MACHINE for sheets 144" long, 3 sets of removable dies.
1—HALLDEN STRAIGHTENING AND CUT-OFF MACHINE, capacity 5/16" to ⅝" dia x 14 ft.
1—POINTER, tube 2" O.D. x ¼" wall maximum.
1—1500 HP GEAR DRIVE, ratio 8 to 1.
1—1200 HP GEAR DRIVE, 295 to 30 RPM.
1—400 HP GEAR DRIVE, 8.2 to 1 ratio.
1—1500 HP MOTOR, 2300 volts, 3 phase, 60 cycle, 240 RPM.
1—600 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.
1—400 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 360 RPM.
1—75-TON HOT METAL CRANE, 59' SPAN, 4 GIRDERS

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2 PUSHER MACHINES

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800 Cu. Ft. Larry 14'8" Ga. 230V. DC (2)
65 Ton Hot Metal Std. Ga. w/65 Ton Ladles (4)
50 Ton Slag Std. Ga. w/300 Cu. Ft. Ladles (2)
50 Ton Slag Std. Ga. w/260 Cu. Ft. Ladles (2)
50 Ton Transfer Std. Ga. 230V. DC
10 Ton Quenching Std. Ga. 41'6" Wheelbase

OVERHEAD CRANES 230V. D.C.

110 Ton Cleveland Ladle 48'5" Span
20 Ton Shaw 41'7" Span, Cab Oper.
10 Ton Shaw 52' Span, Cab Oper.
10 Ton Bedford ¾ Yd. Bucket 61' Span

ELECTRIC BRIDGE 230V. D.C.

Travelling on Rail, 230' Span, plus 80' Cantilever, 6 Ton Bucket, Single Trolley, Motor Driven

MISCELLANEOUS

Penna. HAMMERMILLS SX13 400 HP (3)
Koppers 2 Roll CRUSHER 36"x42", 40 HP
Trimmer CONVEYOR 30"x13'3" c/c Cleated
100 Ton PRINTOMATIC Larry Car SCALE, 14'8" c/c Rail
50 Ton 60' Platform Printomatic TRUCK SCALE
30 Ton 40' Platform Printomatic TRUCK SCALE
CAR HAULS, Drum Type 20"x18", 25 HP
SKIP HOIST Lidgerwood 178'
MOTORS, DC Type CO & MD Series & Compound Wound 230V. 1 to 200 HP (100)
MOTORS, AC 3/60/440V. Squirrel Cage & Slip Ring 1 to 100 HP (100)

Representative on Premises DUnkirk 9-3380

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DIAMETER OF RAM 62"
STROKE OF RAM 40"
2—17" DIA PULLBACKS
MOVING DOWN TYPE
WITH INTENSIFIER
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WT. 620,000#

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M-G SETS 3PH-60 CY.

Qu.	KW	Make	RPM	DC Volts	AC Volts
2	4800(SU)	GE	450	300	2300/4600
1	2400	GE	450	300	2300/4600
1	2000	GE	514	600	2300/4600
2	1750/2100	GE	514	250/300	2300/4600
1	1750	GE	514	600	2300/4600
1	1500	GE	720	600	6600/13200
1	1000	GE	720	275	2300/4160
1	1000	GE	900	260	4000/6600
1	1000	GE	900	600	2300/4160
1	500	GE	900	125/250	440
1	500(New)	GE	1200	300	2300
1	500	GE	900	250	2300/4160/4160
1	300	GE	1200	275	2300/4160
1	300	GE	1200	250	440/2300
1	250	GE	900	250	440/2300
1	240	Whse.	900	125	220/440
1	200	Whse.	1200	550	2300
1	200	El. Mhy.	1200	250	2300/4600
1	150	GE	1200	275	2300
1	150	Whse.	1200	275	2300

D. C. MOTORS

Qu.	KW	Make	Type	Volts	RPM
1	3900(New)	GE	Enc. S.V.	475	320
1	3000(New)	Whse.	Enc. F.V.	525	600
2	2700	GE	Enc. S.V.	415	280
1	2250(New)	GE	Enc. S.V.	600	200/300
1	2200	GE	MCF	600	400/500
2	2000	GE	Enc. S.V.	350	230/350
2	1750	GE	Enc. S.V.	250	175/350
2	1500	Whse.	New	600	300/700
4	1500	Whse.	New	525	600
1	1300	GE	MCF	300	200/480
1	1200	GE	MCF	600	450/600
1	1000	Whse.		500	800/2000
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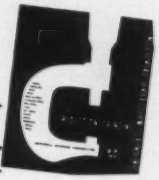

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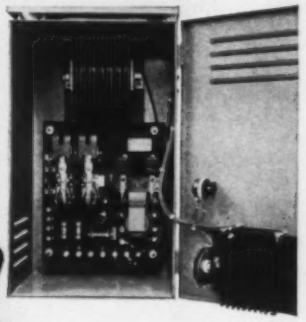

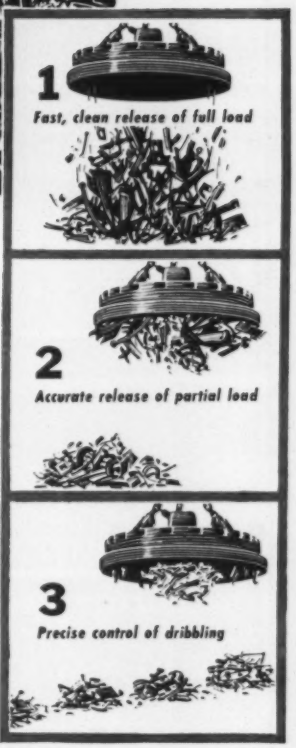

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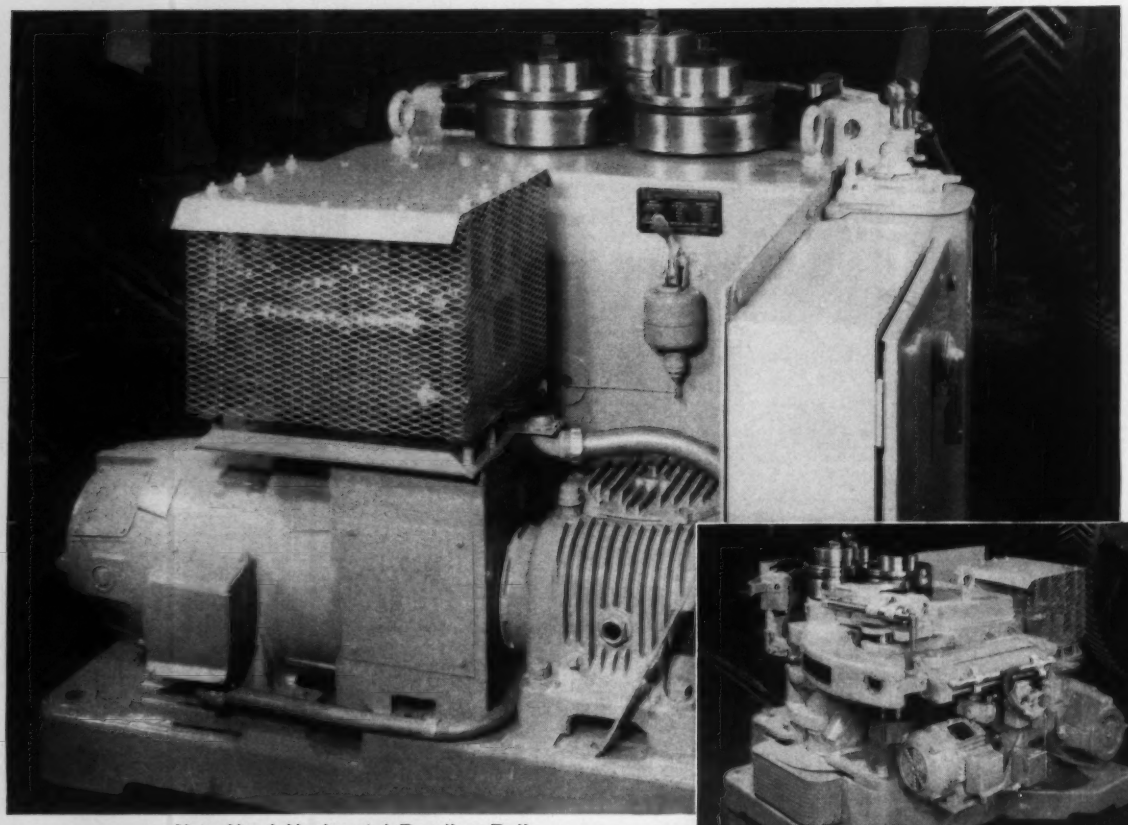

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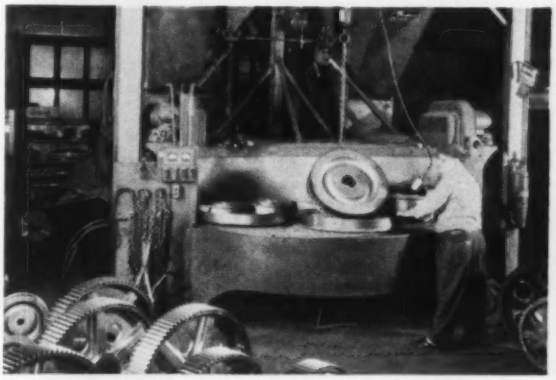

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